Three Essays on Accounting Standard Setting, Corporate Governance and Investor Behavior

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To The Reader

Research in the area of financial accounting tends to reach out to neighboring fields. The thesis of Marcus Witzky is no exception. The first study explores standard setting, the second the inter-relatedness of enforcement and corporate governance and the last study investigates the monitoring behavior of individual investors. Doing so, the first study touches on political science, the second project is close to legal studies and the last paper addresses questions of behavioral finance. In terms of methodology, all studies are based on carefully collected data. While people are generally longing for causal identification these days, Marcus aims for careful descriptive evidence. Given that cases of "establishing causality by arguing" are still somewhat common in the literature, personally, I am very sympathetic to this honest and humble approach to empirical work.

One might wonder: How are these studies connected? It is tempting to reverse their order to discuss this. The last study documents that individual investors tend to be generally only superficial users of financial accounting information and this seems particularly true when they are less educated and experienced. While this finding itself is hardly surprising and also not new, the project establishes an interesting fact by documenting that less trusting investors also are less intensive financial accounting information users. This should be interesting to standard setters and links to the first study of the thesis exploring the personal characteristics of IASB members and how these characteristics are related to the standards issued by the IASB. It can be concluded from Marcus' interesting data that the IASB is not catering to individual investors. Instead, it focuses on professional investors and the financial community in general. While this seems sensible in light of the prior findings, ultimately, it is the result of a political decision. As we know, political positions are subject to change and the recent reform of the German Federal Ministry of Justice as the new Federal Ministry of Justice and Consumer Protection and similar shifts at the European level open the room for speculations about the future role of individual investors for the IASB. Besides user-oriented standard setting, enforcement and corporate governance mechanisms are alternative means to establish trust in financial reporting. This links the prior studies to the second study and closes the circle.

In combination, financial accounting requires efficient standard setters with a well-defined user focus and institutions that ensure that the issued standards are consistently and rigorously applied. The resulting disclosures should be useful to investors and contribute to the efficiency of capital markets. The work of Marcus Witzky contributes to the academic debate about these big issues by providing new descriptive insights. I hope that his studies will be widely read and used.

Berlin, November 2015
Joachim Gassen

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Berlin, November 2015
Marcus Witzky

Abstract

English: This cumulative doctoral thesis consists of three papers within the field of empirical financial accounting research. The first paper examines the role of personal characteristics of accounting standard setters in the development of the International Financial Reporting Standards (IFRS). It documents that the full set of IFRS exhibited a decrease in the importance of principles relative to rules and an increase in its fair value orientation over time. Changes in IFRS properties are found to be associated with the professional and cultural background of International Accounting Standards Board (IASB) members. The second paper investigates determinants and consequences of erroneous financial reporting under the German financial reporting enforcement regime. The corporate governance of firms detected with erroneous financial reporting is found to differ systematically from that of control firms. Further results suggest that error detection might trigger improvements in firm-level accounting oversight. The third paper uses large-scale survey evidence from German individual investors to explore the determinants of their monitoring behavior. Investors who are less trusting in their fellow stakeholders are found to engage in less monitoring. Furthermore, trust and monitoring are documented to be associated with the stock market exposure and the educational background of investors.

Deutsch: Die vorliegende kumulative Doktorarbeit umfasst drei Arbeiten aus dem Bereich der empirischen Rechnungslegungsforschung. Die erste Arbeit untersucht die Rolle persönlicher Eigenschaften von Rechnungslegungsstandardsetzern bei der Entwicklung der Internationalen Rechnungslegungsstandards IFRS. Sie dokumentiert, dass in den IFRS insgesamt ein Rückgang der Bedeutung von Prinzipien gegenüber Regeln sowie ein Anstieg der Bedeutung des beizulegenden Zeitwerts im Zeitablauf zu verzeichnen sind. Zwischen Änderungen von IFRS-Eigenschaften sowie beruflichen und kulturellen Eigenschaften von Mitgliedern des International Accounting Standards Board (IASB) wird ein Zusammenhang festgestellt. Die zweite Arbeit widmet sich Ursachen und Folgen fehlerhafter Finanzberichterstattung im Rahmen des deutschen Systems der Durchsetzung von Rechnungslegungsregeln. Sie findet systematische Unterschiede in der Unternehmensführung von Unternehmen, bei denen fehlerhafte Finanzberichte festgestellt werden, gegenüber einer Kontrollgruppe. Weitere Ergebnisse lassen die Vermutung zu, dass die Aufdeckung fehlerhafter Finanzberichte Verbesserungen in der unternehmensspezifischen Aufsicht über den Rechnungslegungsprozess auslösen könnte. Die dritte Arbeit nutzt umfangreiche Befragungsergebnisse deutscher Privatanleger zur Untersuchung der Ursachen ihres Unternehmensüberwachungsverhaltens. Demnach üben Anleger, die ein geringeres Vertrauen in andere Anspruchsgruppen eines Unternehmens haben, zugleich eine geringere Unternehmensüberwachung aus. Darüber hinaus dokumentiert die Arbeit, dass Vertrauen und Unternehmensüberwachung in einem Zusammenhang mit dem Ausmaß der Teilnahme am Aktienmarkt und dem Bildungshintergrund der Anleger stehen.

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An Introductory Summary

Following Wysocki (2011), I understand financial accounting as an institution intended to lower transaction costs in an economy and thus fostering economic development. This effect arises from two properties of financial accounting. First, it can reduce information asymmetries between market participants. Second, it can serve as a reference point for contracting. Altogether, financial accounting can lower the cost of coordination. However, it is not the only institution in an economy and consequently develops endogenously. As Wysocki (2011) argues, the efficiency of a financial accounting system depends on its interdependencies with other institutions like, for example, the legal system, corporate governance mechanisms, or the enforcement of laws and rules. The existence of numerous interdependencies between financial accounting and other institutions in modern, complex market economics implies that the overall costs and benefits of a financial accounting system are difficult to determine in a single attempt. It might be functional rather to focus—step by step—on gaining a better in-depth understanding of selected important interdependencies. Hopefully, various results will add up to the larger picture at a certain point of time. Consequently, this thesis investigates three important interdependencies: (1) relations between the cultural and professional background of accounting standard setters and the properties of International Financial Reporting Standards, (2) the enforcement of accounting standards and subsequent changes in the corporate governance of firms targeted by enforcement actions, and (3) demand for financial accounting information from individual investors in the presence of distrust in other market participants.

The first paper of my thesis, titled *The Influence of Standard Setters on the Properties of International Financial Reporting Standards,* adds to the still immature understanding of the accounting standard setting process itself (Gipper, Lombardi, and Skinner 2013). In doing so,

I develop linguistic proxies to measure (1) the importance of principles relative to rules in and (2) the fair value orientation of International Financial Reporting Standards (IFRS). These properties are expected to be related to the fundamental qualitative characteristics of decision-useful information in the IFRS setting: relevance and faithful representation. My analysis proceeds in two steps. First, I provide descriptive insights into the development of the properties of the full set of IFRS. Second, I apply a multivariate research design in order to examine a potential association between changes in the properties of single standards and the personal characteristics of International Accounting Standards Board (IASB) members voting in favor of these changes. My results indicate that both professional and cultural backgrounds of IASB members play a role for IFRS properties. To my knowledge, I am the first to document such an association between personal characteristics of standard setters and properties of accounting standards in the IASB setting. A comparable pattern has been documented for the U.S. Financial Accounting Standards Board before (e.g., Allen and Ramanna 2013; Jiang, Wang, and Xie 2014). However, my study is unique because the international institutional environment in which the IASB operates offers the possibility to examine the role of diverse cultural backgrounds of standard setters.

The second paper of my thesis, titled *Enforcement of Accounting Standards and Changes in Corporate Governance,* adds to the understanding of potential determinants of erroneous financial reporting and of potential consequences of financial reporting enforcement actions. I investigate (1) whether the corporate governance of error firms differs systematically from that of non-error firms and (2) whether error detection is followed by improvements in the corporate governance of error firms. In this regard, corporate governance is defined as the structure of the internal and external accounting oversight institutions at the firm level or, more specifically, of the board of directors and the auditor-client relationship. I examine the German financial reporting enforcement setting because it provides several advantages over to

the U.S. setting which is predominantly examined by prior literature (e.g., Dechow, Sloan, and Sweeney 1996; Farber 2005): First, virtually all error detections result in mandated error announcements to be disclosed by the deviant firms. Second, firms have a high likelihood of being repeatedly and randomly chosen for examination. Third, the setting includes a broad variety of error types without a particular bias towards extreme cases of errors (i.e., fraud). Altogether, I am confident that these features enable a better empirical inference. My analysis proceeds in two steps. First, I provide descriptive evidence on the German financial reporting enforcement regime and document that non-governance firm characteristics explain the likelihood of being a firm with erroneous financial reporting to a limited extent only. Second, using a difference-in-differences approach on a matched sample, I find that error firms seem to be different from control firms in the error year with respect to both the auditor-client relationship and the structure of the supervisory board[1] in the error year. In the first fiscal year after error disclosure, differences to control firms are insignificant with respect to the structure of the supervisory board while differences regarding the auditor-client relationship partly persist. This may be interpreted as financial reporting enforcement being effective to some extent in preventing potential future errors by triggering improvements in firm-level accounting oversight.

The third paper of my thesis, titled *Monitoring by Individual Investors,* is co-authored by Joachim Gassen. Our study is concerned with two mechanism to address information asymmetries in markets: trust and monitoring. While prior research on the monitoring role of investors has focused almost exclusively on institutional investors, we use large-scale survey evidence from Ernst, Gassen, and Pellens (2009) on German individual investors to explore the determinants of their monitoring behavior. Assuming that individual investors more or less rationally choose to free-ride on the monitoring efforts of institutional investors, one

[1] Joint-stock companies in Germany are required to have a two-tiered board system—a supervisory board exercising corporate control over a separate management board responsible for daily operations (Fohlin 2007).

would assume that they provide little effort in monitoring and instead trust their more experienced institutional counterparts to discipline management. However, based on our data, we find that a significant portion of the investors in our sample is not trusting. Instead, they state that they perceive a high risk that other stakeholder groups are betraying their wealth position. At the same time, we find that "untrusting" investors are less active monitors measured by their engagement in financial accounting information acquisition and their exercise of shareholder voting rights. In order to understand the mechanics behind this striking correlation, we use structural equation modeling to explore the links between educational background in economics or business, stock market exposure, trust and monitoring activity. Our data suggests that better-educated investors having higher levels of stock market exposure, trust and monitoring activities. In addition, investors with higher stock market exposure engage more in monitoring activities and lower levels of trust trigger lower exposure to the stock market but have no direct effect on monitoring activities. Our findings should be relevant to regulators since they help to understand a group of investors that is most likely less willing to invest in the stock market. Understanding the mindset of these investors should help to address their concerns. Improving the financial knowledge of individual investors might increase trust, monitoring activities, and stock market participation.

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I

The Influence of Standard Setters on the Properties of International Financial Reporting Standards

Marcus Witzky

Abstract

This paper investigates whether and how personal characteristics of International Accounting Standards Board (IASB) members are associated with properties of International Financial Reporting Standards (IFRS). Properties of IFRS are captured by linguistic proxies. I document that the overall importance of principles relative to rules in the full set of IFRS decreased over time, while the overall fair value orientation increased. Focusing on single IASB decisions on IFRS changes, I find that members with an auditing background are associated with decreases in the importance of principles relative to rules, while members from common law countries are associated with increases in the importance of principles relative to rules. Furthermore, the results suggest that members with an auditing or financial services background are associated with increases in fair value orientation. This paper is the first to document an association between personal characteristics of standard setters and properties of accounting standards in the IASB setting. Furthermore, I provide detailed descriptive evidence on the time series of IFRS properties and IASB membership.

Keywords: Standard Setting, IASB, IFRS, Principles-based Accounting, Fair Value

JEL Classification: D72, D78, M40, M41, M48

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1 Introduction

Positive accounting research still has an immature understanding of the accounting standard setting process itself (Gipper, Lombardi, and Skinner 2013). I add to this gap in the literature by investigating whether and how personal characteristics of International Accounting Standards Board (IASB) members are associated with properties of International Financial Reporting Standards (IFRS). Personal characteristics of IASB members are examined in terms of their professional and cultural background. IFRS properties are captured by linguistic proxies measuring (1) the importance of principles relative to rules and (2) the fair value orientation of final standards. I focus on these properties because I expect them to be related to the fundamental qualitative characteristics of decision-useful information in the IFRS setting: relevance and faithful representation (IASB, 2010: par. QC4–QC18). I conduct my analysis in two steps. First, I provide descriptive insights into the development of the properties of the full set of IFRS. Second, I apply a multivariate research design in order to examine a potential association between changes in the properties of single standards and the personal characteristics of IASB members voting in favor of these changes.

For analyzing the importance of principles relative to rules, I calculate the number of principles (bold type) paragraphs relative to the number of all paragraphs and document a considerable decrease in the importance of principles relative to rules in the full set of IFRS by 41.0% between 2001 and 2013. For analyzing fair value orientation, I relate the frequency of fair value measurement terms to the frequency of all measurement terms and document a steady increase in the fair value orientation of the full set of IFRS by 31.3% between 2001 and 2013. For the second step of my analysis, I identify 105 IASB decisions on IFRS changes between 2001 and the end of 2012. After sample adjustments, I am able to use 71 documents for my multivariate analysis. Using probit models, I regress the probability of a decision resulting in an increase or decrease in standard properties on the average personal characteris-

tics of the IASB members voting in favor of that change. I show that decreases in the importance of principles relative to rules are associated with IASB members having a professional background in auditing while increases are associated with members from common law countries. Furthermore, I show that increases in fair value orientation are associated with IASB members having a professional background in auditing or financial services.

My results indicate that both professional and cultural backgrounds of IASB members play a role for IFRS properties. To my knowledge, I am the first to document such an association between personal characteristics of standard setters and properties of accounting standards in the IASB setting. A comparable pattern has been documented for the U.S. Financial Accounting Standards Board (FASB) before (Allen and Ramanna 2013; Jiang, Wang, and Xie 2013). However, my study is unique because the international institutional environment in which the IASB operates offers the possibility to examine the role of diverse cultural backgrounds of standard setters. I discuss my findings with respect to the institutional environment the IASB is exposed to and the political process of accounting standard setting. First, there seems to be a demand for rules-based accounting and fair value measurement in the IFRS context. Second, the documented development of IFRS properties could be due to a consensus within the IASB to balance relevance and faithful representation of accounting information in its standard setting activity. Third, the documented development of IFRS properties could be due to a political compromise between IASB members preferring either a valuation or a stewardship perspective on accounting.

This paper contributes to at least three streams of literature. First, I add to the descriptive literature on IFRS by developing linguistic proxies to evaluate the development of IFRS properties (e.g., Benston, Bromwich, and Wagenhofer 2006; Cairns 2006; Carmona and Trombetta 2008). Second, I add to the literature on the influence of the institutional environment on accounting standards and information (e.g., Ball, Kothari, and Robin 2000; Leuz,

Nanda, and Wysocki 2003; Burgstahler, Hail, and Leuz 2006; Hail 2013) by exploring a mechanism through which cultural and other institutional factors shape accounting outcomes. Third, by building on the work of Allen and Ramanna (2013), I strengthen the understanding of the role of standard setters in accounting standard setting as I examine a more heterogeneous setting compared to that of the FASB.

The remainder of the paper is organized as follows. Section 2 provides details on the construction and the time series of my linguistic proxies for IFRS properties. Section 3 describes the institutional context of the IASB and presents the time series of the personal characteristics of its members. Section 4 explains the design of my multivariate analysis and presents the results on associations between personal characteristics of IASB members and IFRS properties. Section 5 discusses the results. Section 6 concludes.

2 Measurement of IFRS properties

2.1 Data and size of the IFRS universe

Prior literature has shed light on IFRS properties already (e.g., Benston et al. 2006; Cairns 2006; Carmona and Trombetta 2008), investigated differences in accounting treatments between local GAAP and IFRS (e.g., Street 2002; Ding, Jeanjean, and Stolowy 2005; Ding, Hope, Jeanjean, and Stolowy 2007; Bae, Tan, and Welker 2008), the IFRS harmonization process (e.g., Garrido, León, and Zorio 2002), and convergence between local GAAP and IFRS (e.g., Fontes, Rodrigues, and Craig 2005). Unfortunately, the results are not sufficient for my purpose, since they either describe a status quo at a certain point of time or are of qualitative nature and therefore not useful for empirical analysis. I develop suitable measures for IFRS properties by analyzing the texts of final standards following a linguistic approach. Hereby, I limit the influence of personal judgment on my measures.

In order to systematically analyze the development of IFRS properties, I need consolidated texts of all standard versions over time. Unfortunately, they are not available continuously. Only IASB documents that issue new standards or revise existing standards provide the new consolidated versions. IASB documents that amend existing standards just instruct how the texts of the targeted standards are to be changed. Consolidated versions of all standards are available on a year-by-year basis only in the IFRS Red Books (or Bound Volumes of IFRS, as they were called before 2009). The Red Books are published by the IFRS Foundation each year and provide the consolidated versions of all standards as issued at January 1 of the respective year. However, two exceptions exist: (1) the 2004 Red Book provides the consolidated versions as issued at March 31, and (2) the 2008 Red Book provides the consolidated versions as issued at January 17. It should be noted that the Red Books do not provide the effective standard versions at the reference date (which can be found in the IFRS Blue Books) but the latest versions as approved by the IASB, even if they will become effective after the reference date. Standards which are still effective at the reference date, but which the IASB has decided to withdraw, are not part of the Red Books. My examination period starts in 2001 when the IASB resumed responsibility for international accounting standard setting. The IASB adopted all International Accounting Standards (IAS) issued by its predecessor, the International Accounting Standards Committee (IASC) Board, making them the core of what is now called IFRS (see Zeff 2012, for a historical overview). Therefore, the first Red Book I use is that of 2001, the last one published by the IASC.

I access the Red Books digitally using the eIFRS website. IAS 19 (Employee Benefits) of 2001 cannot be used as it is incomplete. Therefore, I duplicate IAS 19 of 2002, as there was no change in the meantime. Including the duplicate, I obtain 481 standard-year observations between 2001 and 2013. For reasons of comparability, I focus on the pure text of standards only. This excludes the introduction, table of contents, basis for conclusions, and implementa-

tion guidance. Appendices are included when it is stated that they form an integral part of the standard. Illustrative examples are included when they are presented within the course of the pure text of a standard.

Figure 1 and Table 1 present the size of the IFRS universe, i.e. the full set of standards, over time. The number of standards increases from 34 in 2001 to 41 in 2013 (+20.6%). The sum of words in all standards increases even stronger from 202,217 in 2001 to 354,405 in 2013 (+75.3%). Two considerable yearly changes are noteworthy. First, between 2003 and 2004 the sum of words increases by 30.0% due to the completion of the first major IASB projects. Between June 2003 and March 2004 five new standards are issued (IFRS 1 to IFRS 5) and 16 of the existing standards are revised. Second, between 2011 and 2012 the sum of words increases by 12.1% which is largely due to the issuance of IFRS 10 to IFRS 13.

[Figure 1 about here]

[Table 1 about here]

2.2 Importance of principles relative to rules

The IFRS Preface explains: "Standards approved by the IASB include paragraphs in bold type and plain type, which have equal authority. Paragraphs in bold type indicate the main principles. […]" (IASB 2002: par. 13) This distinction was not clarified in the Preface to Statements of International Accounting Standards which was effective until 2002. However, it was applied by the IASC Board already. In order to measure the importance of principles relative to rules, I count the number of bold and plain type paragraphs in all standard-year observations. Following the IFRS Preface, I interpret bold type paragraphs as principles paragraphs. In contrast, I assume that plain type paragraphs represent rules and interpret them as rules paragraphs.

As Figure 2 and Table 2 show, the sum of principles paragraphs in the IFRS universe decreases only slightly by 4.5% between 2001 and 2013. In contrast, the sum of rules para-

graphs in the IFRS universe increases strongly by 94.6% during that time. %PRIN is the share of principles paragraphs based on all paragraphs and decreases by 41.0% between in 2001 and 2013. This indicates a considerable decline in the importance of principles relative to rules in IFRS.

[Figure 2 about here]

[Table 2 about here]

2.3 Fair value orientation

In order to capture fair value orientation, I have to assess the importance of fair value measurement relative to the importance of other measurement concepts. Nobes (2001) suggests different classifications of asset measurement bases. One is the distinction between past and current measurement bases. The only past measurement base is historical cost, while fair value belongs to the group of current measurement bases. Following the 2005 IASB discussion paper about measurement bases for financial accounting, I identify as current measurement bases besides fair value: (1) current cost and its two forms, reproduction cost and replacement cost, (2) net realizable value, and (3) value in use. Deprival value and recoverable amount are not included because they are combinations of measurement bases. Furthermore, present value in not included because it does not represent a measurement base but a technique that can be used to estimate measurement bases (IASB 2005: par. 66–96).

Fair value and its sub-concept, fair value less costs to sell, were used in IFRS under different names for some time: (1) until the issuance of IFRS 5 (Non-current Assets Held for Sale and Discontinued Operations) in March 2004 fair value less costs to sell was called net selling price, and (2) until the issuance of IFRS 13 (Fair Value Measurement) in May 2011 in some cases the term market value was used instead of fair value. When I examine in the following the importance of fair value measurement, this actually comprises fair value, market

value, fair value less costs to sell, and net selling price. The full classification of measurement bases that I use in this paper is illustrated in Figure 3.

[Figure 3 about here]

I want to evaluate the frequency of terms related to the different measurement concepts in all standard-year observations. Searching for the respective major terms alone is not sufficient. For example, the term "historical cost" is rarely used in IFRS. Instead, it is often stated that an item should be measured "at cost". On the other hand, the term "fair value" is used in numerous contexts. Therefore, I decide to search for specific phrases that can usually be found in a measurement context. I define fair value measurement terms as all possible combinations of the prefixes "at", "at its", "at the" and "at their" on the one hand with the terms "fair value", "market value" and "net selling price" on the other hand.[2] Other current measurement terms are defined as all possible combinations of the prefixes "at", "at its", "at the" and "at their" on the one hand with the terms "current cost", "replacement cost", "reproduction cost", "net realisable value" and "value in use" on the other hand. Historical cost measurement terms are defined as all possible combinations of the prefixes "at", "at its", "at the" and "at their" on the one hand with the terms "cost", "historical cost", "amortised cost" and "depreciated cost" on the other hand. The construction of the measurement terms is summarized in Figure 4.[3]

[Figure 4 about here]

Figure 5 and Table 3 show the overall development of fair value orientation based on measurement terms. The frequency of fair value terms in the IFRS universe increases considerably from 106 in 2001 to 339 in 2013 (+219.8%). In 2001, fair value terms can be found in 59% of the standards, while in 2013 85% of all standards contain such terms. The frequency of other current value terms is small and constant over time (7). In the frequency of historical

[2] The term "fair value less costs to sell" is not listed as its appearance is covered by searching for "fair value".

[3] I search for "amortised cost" and "net realisable value" because these are the British forms of writing used in IFRS.

cost terms, I observe an increase from 70 in 2001 to 100 in 2013 (+42.9%). %FV_MT is the share of fair value terms based on all measurement terms. It increases by 31.3% between 2001 and 2013, indicating an increase in the fair value orientation of IFRS over time.

[Figure 5 about here]

[Table 3 about here]

In order to add to the robustness of my analysis, I offer an alternative measure for fair value orientation: the frequency of the single term "fair value" relative to the frequency of the single term "cost". This measure is more simple and straightforward on the one hand but probably induces more noise on the other hand because the terms "fair value" and "cost" are used in various contexts besides measurement bases.

Figure 6 and Table 4 show the overall development of fair value orientation based on the terms "fair value" and "cost". The frequency of the term "fair value" in the IFRS universe increases from 645 in 2001 to 1,568 in 2013 (+143.1%). In 2001, the term "fair value" can be found in 65% of the standards, while in 2013 90% of all standards contain this term. In the frequency of the term "cost" I observe an increase from 985 in 2001 to 1,261 in 2013 (+28.0%). %FV_CO is the frequency of the term "fair value" divided by the sum of the frequencies of the terms "fair value" and "cost". It increases by 39.9% between 2001 and 2013. Compared to my first measure, the overall increase of fair value orientation is even more pronounced when using my alternative measure.

[Figure 6 about here]

[Table 4 about here]

3 IASB member characteristics

3.1 Structure and member selection

The IASB is a body of the IFRS Foundation (until 2010: IASC Foundation), a not-for-profit corporation under the General Corporation Law of the State of Delaware with its principal office in London. The governance structure of the IFRS Foundation is defined in its constitution, of which the first version was approved by the members of the IASC in May 2000. Following the constitution, the IASB has the complete responsibility for developing and issuing IFRS. IASB members are appointed by the Trustees of the IFRS Foundation, who are responsible for all governance issues besides standard setting. The names of the first IASB members were announced on January 25, 2001 (Camfferman and Zeff 2006: 497–498).

In the beginning, the main qualification required for IASB membership was technical expertise. Following criticism of the IASB as being too theoretical (Zeff 2012: 827–828), this criterion was replaced in 2005 by professional competence and practical experience. At the same time, an existing minimum quota for the professional background of IASB members was dropped. A member selection based on geographical criteria was not allowed for the most time of IASB history. However, in July 2012, a minimum quota for the geographical background of IASB members based on continental regions became effective. The number of IASB members required by the constitution increased from 14 to 16 over time, most of them serving as full-time members. In order to approve an IFRS change, the required qualified majority of IASB members increased from eight to ten over time. Table 5 shows the development of the IASB structure as defined by the constitution in detail.

[Table 5 about here]

Beyond these criteria, the details of IASB member selection by the Trustees are non-public. In order to better understand the selection process and to identify potential drivers of

selection decisions, one would have to focus on how the Trustees of the IFRS Foundation are selected in first stage, actually. Although selection criteria for Trustees exist in the constitution, as well, this process is difficult to comprehend as Trustees are appointed by co-optation. The implementation of the Monitoring Board in 2009 as formal link between the Trustees and public capital market authorities changed the Trustee selection process slightly in the way that appointments of Trustees have to be approved by the Monitoring Board. However, the selection of new Trustees itself still is in the responsibility of the existing Trustees. Therefore, when I provide evidence on the development of personal characteristics of IASB members in the following, it remains open whether and to what extent this development is determined by the personal characteristics of the Trustees of the IFRS Foundation in the first stage.

3.2 Professional and cultural background

From the IASB's inception in 2001 until the end of 2013, 33 men and women served as IASB members. Using annual reports and press releases of the IFRS Foundation, I identify for all of them (1) the month when joining the IASB,[4] (2) the month when leaving the IASB, (3) the home country, and (4) the last principal occupation before joining the IASB. Home country is supposed to be the country of birth. In the case that I am not able to identify this for a certain individual, home country is the country of his or her principal education. If the last principal occupation of an individual was being a member or employee of an accounting standard setting body, I additionally identify the last principal occupation outside of standard setting.

I classify the professional background of each IASB member by his or her last principal occupation that was not related to accounting standard setting. I build on the basic classification of professional backgrounds that is used in the constitution of the IFRS Foundation for selecting the Trustees: auditing, preparer of financial statements, user of financial statements,

[4] There can be a time difference between being appointed to the IASB and joining the IASB.

and academia. I adjust this structure as follows: (1) the only unambiguous group of users in my setting are analysts, (2) a background in banking or insurance is treated as a group of its own, as these industries can be seen as both, preparers and users of financial statements, and (3) I include government as a group for all individuals that served for a public authority outside of academia. Unfortunately, I am not able to classify one member (Warren J. McGregor) based on this structure. His professional background is classified as unclear. Table 6 provides the characteristics of all IASB members in detail.

[Table 6 about here]

Figure 7 and Table 7 illustrate the development of the professional background by January of each year. The distribution of backgrounds is stable during the first six years of IASB history. The most important group in the beginning is auditing (six of 14). However, the importance of this group decreases considerably after 2010. In 2013, no more than two of 15 members have an auditing background. The number of members with a background in academia or as preparer decreases, as well. In contrast, the number of members with a background as analyst, in banking/insurance or in government increases. Especially the development of the government group is noteworthy. Before 2007, there are no IASB members with such a background, at all. In contrast, members with a government background represent the most important professional group in the IASB in 2013 (five of 15). Additionally, I find that the number of members having their last principal occupation in accounting standard setting decreases over time (from four of 14 in 2001 to one of 15 in 2013).

[Figure 7 about here]

[Table 7 about here]

For analyzing the cultural background of IASB members, I do not focus on home countries directly, but classify members by the legal origin of the company law or commercial code of their home countries. Hereby, I follow the approach of La Porta, Lopez-de-Silanes,

Shleifer, and Vishny (1998), who use data from Reynolds and Flores (1989). There are two major legal families in the world: (1) common law of English origin and (2) civil law of Romano-Germanic origin. Civil law can be divided into French, German and Scandinavian sub-families. The basic conceptual difference between common law and civil law could be summarized as follows: historically, the first one was supposed to protect the free people from the government, while the latter was supposed to enforce the will of the government (Morck and Steier 2007: 40). La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997) provide evidence that civil law countries (especially of the French sub-family) have weaker investor protection and less developed capital markets compared to common law countries.

Figure 8 and Table 8 illustrate the development of the cultural background of IASB members by January of each year. Common law includes members from Australia, Canada, India, New Zealand, South Africa, United Kingdom, and United States. French civil law includes members from Brazil, France, and Netherlands. German civil law includes members from Germany, Japan, South Korea, and Switzerland. Scandinavian civil law includes members from Sweden. IASB members from China are not classified into these families but treated as a separate group. Again, the distribution of backgrounds is stable during the first six years of IASB history. After 2006, the number of members from common law countries decreases from ten of 14 to seven of 15 in 2013. This is actually due to a considerable decline in the number of members from the United Kingdom from four of 14 before 2007 to one of 15 in 2013. In contrast, the absolute number of members from the United States is quite stable, resulting in them becoming relatively more important within the common law group over time. The increase in the number of members from civil law countries is especially attributable to members from French civil law countries.

[Figure 8 about here]

[Table 8 about here]

4 IFRS properties and IASB member characteristics

4.1 Research design

I investigate potential associations between IFRS properties and IASB member characteristics in a multivariate research design. Using probit regressions, I estimate the probabilities that IASB members with certain personal characteristics vote in favor of IFRS changes that either increase or decrease the importance of principles relative to rules or fair value orientation. I use the eIFRS website to identify the voting behavior for 105 IASB decisions on IFRS changes between 2001 and the end of 2012. Of that, 35 amend existing standards as part of improvements projects,[5] 32 amend existing standards outside the improvements projects, 24 revise existing standards and 14 issue new standards. Figure 9 and Table 9 provide an overview. The most active years of standard setting are 2003, 2008 and 2009. In contrast, none or only few changes take place in 2001, 2002, 2006 and 2007. It is noteworthy that dissenting votes and abstentions are common in IASB decisions. Due to the fixed voting requirements for IFRS changes (see subsection 3.1) abstentions have the same effect as dissenting votes. Only 67.6% of the changes were approved unanimously.

[Figure 9 about here]

[Table 9 about here]

The dependent variables of my probit regressions are dummy variables that indicate whether an IASB decision results in either an increase or a decrease in the respective properties of the target standard, using my measures developed in section 2. Since consolidated versions of all standards exist on a yearly basis, only (see subsection 2.1), I have to base this assessment on comparing the target standard version at the beginning of the respective year with the target standard version at the beginning of the following year. In nine cases, the title of an

[5] I split up the voting behavior for the four improvements projects with respect to the various target standards into 35 separate decisions.

amendment names more than one target standard. I identify the principal target standards for each of these cases. Besides changing the target standard itself, an IASB decision usually includes consequential amendments to other standards, as well. Since I am only able to assess the total change of a standard over the full course of a year, consequential amendments could induce noise. However, the impact of consequential amendments is usually rather small. I expect that consequential amendments do not change the importance of principles relative rules or the fair value orientation of standards.

%PRIN_inc is a dummy variable that equals one if a decision results in an increase in the share of principles paragraphs based on the number of all paragraphs and zero if not. %PRIN_dec is a dummy variable that equals one if a decision results in a decrease in the share of principles paragraphs based on the number of all paragraphs and zero if not. %FV_MT_inc is a dummy variable that equals one if a decision results in an increase in the share of fair value measurement terms based on all measurement terms and zero if not. %FV_MT_dec is a dummy variable that equals one if a decision results in a decrease in the share of fair value measurement terms based on all measurement terms and zero if not.[6] %FV_CO_inc is a dummy variable that equals one if a decision results in an increase in the frequency of the term "fair value" divided by the sum of the frequencies of the terms "fair value" and "cost" and zero if not. %FV_CO_dec is a dummy variable that equals one if a decision results in a decrease in the frequency of the term "fair value" divided by the sum of the frequencies of the terms "fair value" and "cost" and zero if not.[7]

I calculate for each decision the share of professional and cultural backgrounds based on the IASB members who vote in favor of the respective change. However, I only include a

[6] If there are no measurement terms at all in a standard version at the beginning of a year, I interpret this as fair value measurement terms being as unimportant as other measurement terms. Therefore, I assume in this case that the share of fair value measurement terms equals 0.5.

[7] If there are no "fair value" or "cost" terms at all in a standard version at the beginning of a year, I interpret this as the term "fair value" being as unimportant as the term "cost". Therefore, I assume in this case that the share of the term "fair value" equals 0.5.

small selection of the professional and cultural background groups that I presented in subsection 3.2 for my multivariate analysis. On the one hand, 105 IFRS changes between 2001 and 2012 constitute a rather small basic population. I do not want to reduce the power of this setting by including too many independent variables. On the other hand, since there were only 31 IASB members between 2001 and 2012, most professional and cultural groups are rather small in size. If I use too small groups, it could actually happen that I capture rather personal-fixed effects than the effects of professional and cultural backgrounds.

I use %Auditing and %Financial as independent variables for the professional background. %Auditing is defined as the share of IASB members approving a change whose last principal occupation outside of standard setting was in the auditing industry. %Financial is defined as the share of IASB members approving a change whose last principal occupation outside of standard setting was in financial services, i.e. in the analyst, banking or insurance industry. For the cultural background, I use %Common as independent variable. %Common is defined as the share of IASB members approving a change who are from countries in which the legal origin of the company law or commercial code is common law.

4.2 Sample development and descriptive statistics

From the basic population of 105 IASB decisions on IFRS changes, I delete the 13 decisions which issued new standards. Ten standard-year observations are targeted more than once by IASB decisions. Since I am not able to distinguish which decisions changed the standard properties to what extent, I collapse the respective 24 IASB decisions into ten pseudo decisions, one for each standard-year observation. In doing so, I consider only the personal characteristics of the IASB members who voted in favor of all decisions affecting a standard-year observation. Furthermore, I delete one decision targeting IAS 39 (Financial Instruments: Recognition and Measurement) in 2009 and the decision on re-issuing IFRS 9 (Financial Instruments) in 2010 due to the step-by-step introduction of IFRS 9. Finally, I remove all five

decisions in 2011 in order to counter a unique effect that could result from the issuance of IFRS 13 (Fair Value Measurement). I end up with a final sample of 71 IASB decisions. Table 10 summarizes the sample development.

[Table 10 about here]

Of the 71 decisions in the final sample, 28.2% result in an increase in the importance of principles relative to rules and 66.2 % result in a decrease. 26.8% result in an increase in the fair value orientation based on measurement terms, while 11.3% result in a decrease. Summary statistics of the final sample are presented in detail in Table 11. The yearly distribution of IASB decisions in the final sample affecting standard properties is presented in Figure 10 and Figure 11.

[Table 11 about here]

[Figure 10 about here]

[Figure 11 about here]

Table 12 provides Pearson and Spearman correlations for the final sample. The only significant correlation (10% level) between IASB member characteristics and changes in standard properties is a positive association between increases in the importance of principles relative to rules and members from common law countries.

[Table 12 about here]

4.3 Multivariate results

Tables 13 to 15 present my multivariate results using probit regressions. For each of my six dependent variables, I run one regression including only the two independent variables for the professional background and one regression including all three independent variables for professional and cultural backgrounds together. Table 13 shows that decreases in the importance of principles relative to rules are significantly associated with members having an auditing background. A similar association with members having a financial services back-

ground is only significant in the regressions that do not include the variable for cultural background. Furthermore, increases in the importance of principles relative to rules are significantly associated with members from common law countries. Table 14 shows that increases in fair value orientation based on measurement terms are significantly associated with members having an auditing or financial services background. However, I do not find significant associations with members from common law countries. For the regressions presented in Table 15, I use my alternative fair value orientation measure based on the terms "fair value" and "cost". The results confirm my findings presented in Table 14.

[Table 13 about here]

[Table 14 about here]

[Table 15 about here]

5 Discussion

Decreases in the importance of principles relative to rules are associated with IASB members having an auditing background. This is not surprising because rules-based accounting standards provide clearer guidance for audit decisions and hereby reduce litigation costs. In contrast, IASB members from common law countries are associated with increases in importance of principles relative to rules. This seems odd when considering U.S. GAAP which traditionally follow the rules-based accounting approach. However, principles-based accounting increases the flexibility of managers to signal their private information to outsiders. Therefore, it is reasonable for me to expect that members from common law countries, which have relatively well developed capital markets, appreciate more principles-based accounting standards in general. Increases in fair value orientation are associated with IASB members having a financial services or auditing background. While the first one is probably in line with general perception, the latter is surprising to me. I expected members with an auditing background to be skeptical about fair value due to the discretion it provides to preparers of finan-

cial statements when determining fair values, which is particularly the case for level-3 fair values (mark-to-model). One explanation could be that auditors can benefit from the extension of fair value measurement due to increasing demand for fair value-related consulting services.

Ball (2001) shows that accounting regulation evolves endogenously in response to the information demand of an economy. Thus, the characteristics of accounting information differ systematically across countries depending on the institutional environment (e.g., Ball et al. 2000; Leuz et al. 2003; Burgstahler et al. 2006; Hail 2013). This is in line with Watts (2006) who suggests that accounting standard setting is a market-driven process that results in an equilibrium of best practice accounting standards which balance opposing accounting objectives. Furthermore, the equilibrium will be prone to political forces, as well. Hereby, accounting can be influenced either by changes in the underlying economic and institutional environment or by the preferences of special interest groups. This notion of a political influence on regulation is supplemented by economic theory suggesting an idiosyncratic influence of regulators. This influence is performed by regulators who either follow their individual beliefs on ideal regulatory intervention (ideology theory) or who support special interest groups (capture theory) (Kau and Rubin 1979). In the context of accounting, prior literature provides evidence for both, institutional factors influencing the properties of accounting information (e.g., Ball et al. 2000) and idiosyncratic influence of standard setters on accounting standards (Allen and Ramanna 2013; Jiang et al. 2013).

Technically, the institutional environment can affect accounting standards only via the men and women who actually set the standards. Hence, I interpret the idiosyncratic influence of standard setters on accounting standards as a mechanism for the influence of the institutional environment. If standard setters follow individual beliefs, these ideologies will be based on individual personal characteristics like the professional or cultural background. Hence,

ideologies are at least partly a result of the institutional environment to which finally published accounting standards are exposed to. If standard setters are captured by special interest groups, these groups will probably approach standard setters with similar professional or cultural backgrounds. Thus, even potential capture reflects partly the institutional environment to which finally published accounting standards are exposed to. However, I acknowledge that a perfect distinction between ideology and capture is empirically impossible. Altogether, this implies that in the IASB setting the heterogeneity in the personal characteristics of IASB members reflects on average the internationally heterogeneous institutional contexts to which IFRS are exposed to.

Following my results, this implies that in the institutional environment of IFRS exists demand for fair value measurement and rules-based accounting standards. This combination is actually consistent with prior discussions on the design choices accounting standard setters have to make. Following the Conceptual Framework, decision-useful accounting information has two fundamental qualitative characteristics: relevance and faithful representation (IASB 2010: par. QC4–QC16). However, the implementation of these characteristics into accounting standards can be arbitrary. The Conceptual Framework requires decision-useful information to exhibit both characteristics to a sufficient degree (IASB 2010: par. QC17).

Barth (2006), an IASB member between 2001 and 2009, states that fair value measurement is discussed in almost every standard setting project because it is supposed to be the most relevant one in many cases. However, when preparers of financial statements are provided with substantial discretion over determining fair values, particularly when it comes to level-3 fair values (mark-to-model), a high fair value orientation can reduce the degree of faithful representation of accounting information (Kothari, Ramanna, and Skinner 2010). To counter this effect, standard setters would have to provide detailed instructions on the application of fair value measurement to ensure an accounting practice as intended. This results tech-

nically in an increase in rules (Schipper 2003). Hence, the decisions to increase fair value orientation and to decrease the importance of principles relative to rules are probably not independent from each other. When standard setters consider fair value as the most relevant measurement concept, they have to incorporate sufficient rules to ensure faithful representation of accounting information at the same time. My results support this notion, suggesting that there could be a consensus within the IASB of balancing the fundamental qualitative characteristics of accounting information. This trade off leads to an increase in fair value orientation on the one hand and to a decrease in the importance of principles relative to rules on the other hand.[8]

More conceptually, financial accounting systems are supposed to serve as a single input device in heterogeneous contractual settings (Ball 2001). Prior literature divides the general demand for accounting information into a pre-decision valuation demand and a post-decision stewardship demand (Beaver and Demski 1979). Formal analyses predominantly show that information that is useful for valuation is not necessarily useful for stewardship and vice versa (Gjesdal 1981; Paul 1992; Feltham and Xie 1994; Christensen and Demski 2003), which is corroborated by empirical evidence (Gassen 2008). However, recent analytical (Drymiotes and Hemmer 2013) and empirical (e.g., Bushman, Engel, and Smith 2006) work questions this view and even the IASB considered to subsume the stewardship objective under a broad resource allocation objective during Phase A of its Conceptual Framework project. Nevertheless, following criticism of the respective discussion paper (IASB 2006), the stewardship objective is still present in the Conceptual Framework (IASB 2010: par. OB4), documenting that the IASB views stewardship as a separate objective (see IASB 2013: par 9.7, as well).

Hence, the IASB has to align its accounting standards towards one of the two objectives. The value relevance literature shows that equity capital markets appreciate fair value-orientated accounting (e.g., Barth, Beaver, and Landsman 1996). Thus, accounting infor-

[8] However, Hans Hoogervorst, chairman of the IASB since 2011, stated: "One persistent myth about the IASB is that we (perhaps secretly) would only be interested in fair value. The truth is that we have always been proponents of a mixed measurement model." (Hoogervorst, 2012)

mation based on fair value is supposed to primarily target the valuation role of accounting.[9] Furthermore, Kothari et al. (2010) outline that a regulator can allocate either less (rules-based approach) or more (principles-based approach) accounting choices to the firm level. Following the principles-based approach, the regulator draws abstract boundaries for accounting treatments and leaves the ex-post solution to preparers and auditors. Following the rules-based approach, the regulator identifies his preferred solution from the set of possible accounting treatments ex ante. I assume that the rules-based approach is consistent with a dominance of the stewardship perspective on accounting because it decreases the opportunistic influence of managers on financial reporting and hence decreases litigation costs from misreporting and the variability of accounting earnings.[10] However, for IFRS I observe both, an increase in fair value orientation and a decrease in the importance of principles relative to rules. Thus, I am not able to identify an overall development towards either the valuation or the stewardship perspective on accounting within IFRS. This might hint at a political process which leads to a compromise between standard setters. It could be the case that the IASB is split into two groups, the first one preferring a valuation perspective on accounting, the second one preferring a stewardship perspective. The observed development of an increasing fair value orientation and a decreasing importance of principles relative to rules could be a classic political compromise which caters the contradicting preferences of both groups to some extent.

This implies that the IASB can use distinct channels in order to align different preferences of accounting standard setters for standards properties. Within these channels, the different preferences are mutually exclusive. For example, the IASB cannot increase fair value orientation and historical cost orientation at the same time. However, the IASB can align a certain channel towards one direction of preferences and another channel towards a different

[9] This view abstracts from the current debate on the influence of market frictions. See e.g. Laux and Leuz (2009) and Kothari et al. (2010) on this issue.

[10] See Ewert and Wagenhofer (2005) for possibly confounding effects of real earnings management.

direction. Thus, I show with my results that in order to better understand accounting standard setting one has to investigate the development of standard properties within different channels.

6 Conclusion

This study sheds light on the development of central IFRS properties and links it to the personal characteristics of IASB members. My analysis proceeds in two steps. First, I document a decrease in the importance of principles relative to rules for the full set of IFRS, and an increase in the fair value orientation of IFRS over time. Second, I show that changes in IFRS properties are associated with certain features of the professional and cultural backgrounds of IASB members who vote in favor of these changes. To my knowledge, these results are new to the literature. However, I acknowledge that the power of my tests is limited due to the short history of IASB standard setting. Furthermore, I emphasize that I document associations only. It remains open whether and to what extent causal relations do exist. Therefore, my results have to be interpreted carefully.

My findings have three potential implications that may enhance the understanding of the accounting standard setting process. First, the composition of the IASB could be understood as a mechanism reflecting the internationally heterogeneous institutional environment to which IFRS are exposed to. Thus, my results imply that there is a demand for rules-based accounting and fair value measurement in the IFRS context. Second, the decrease in the importance of principles relative to rules, and the increase in fair value orientation could be the result of a consensus within the IASB to balance the two fundamental qualitative characteristics of decision-useful accounting information: relevance and faithful representation. Third, instead of a consensus on desired qualitative characteristics, the decrease in the importance of principles relative to rules, and the increase in fair value orientation could be the result of a

classic political compromise between different parties in the IASB preferring either a valuation or a stewardship perspective on accounting.

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Figure 1: Size of the IFRS universe

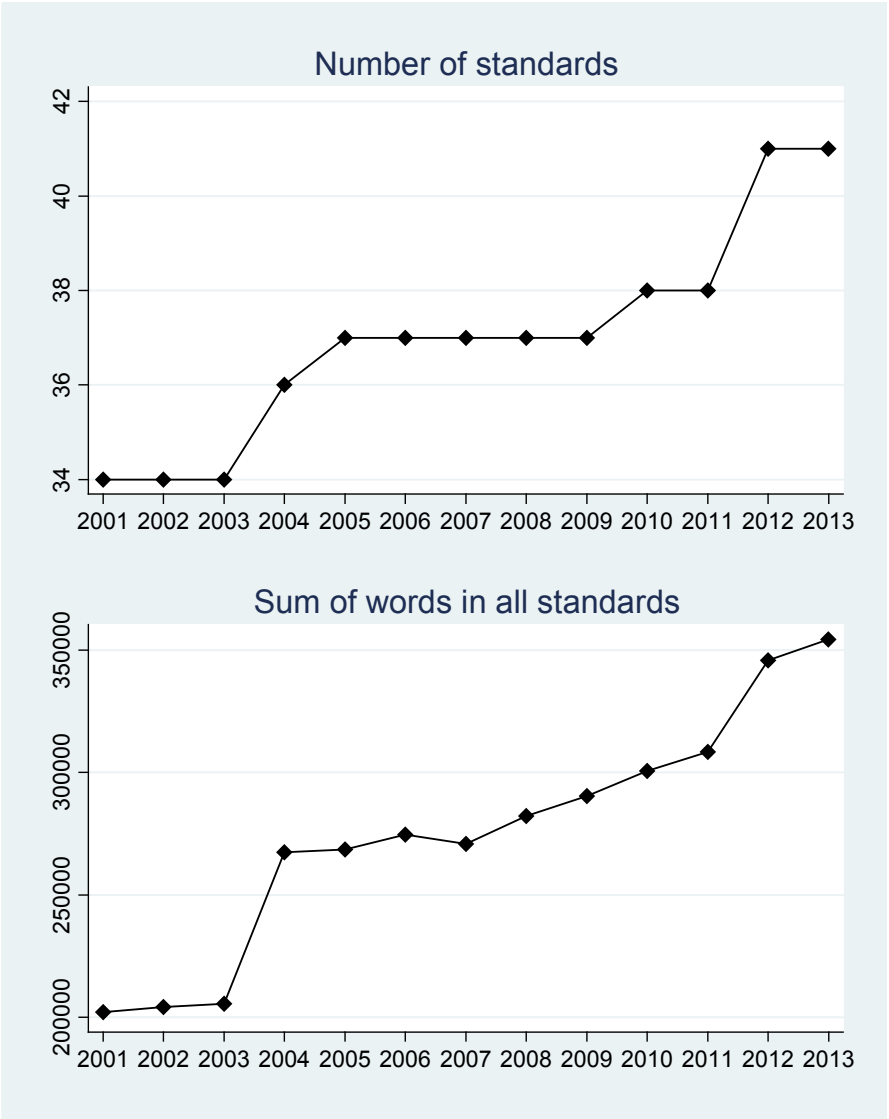
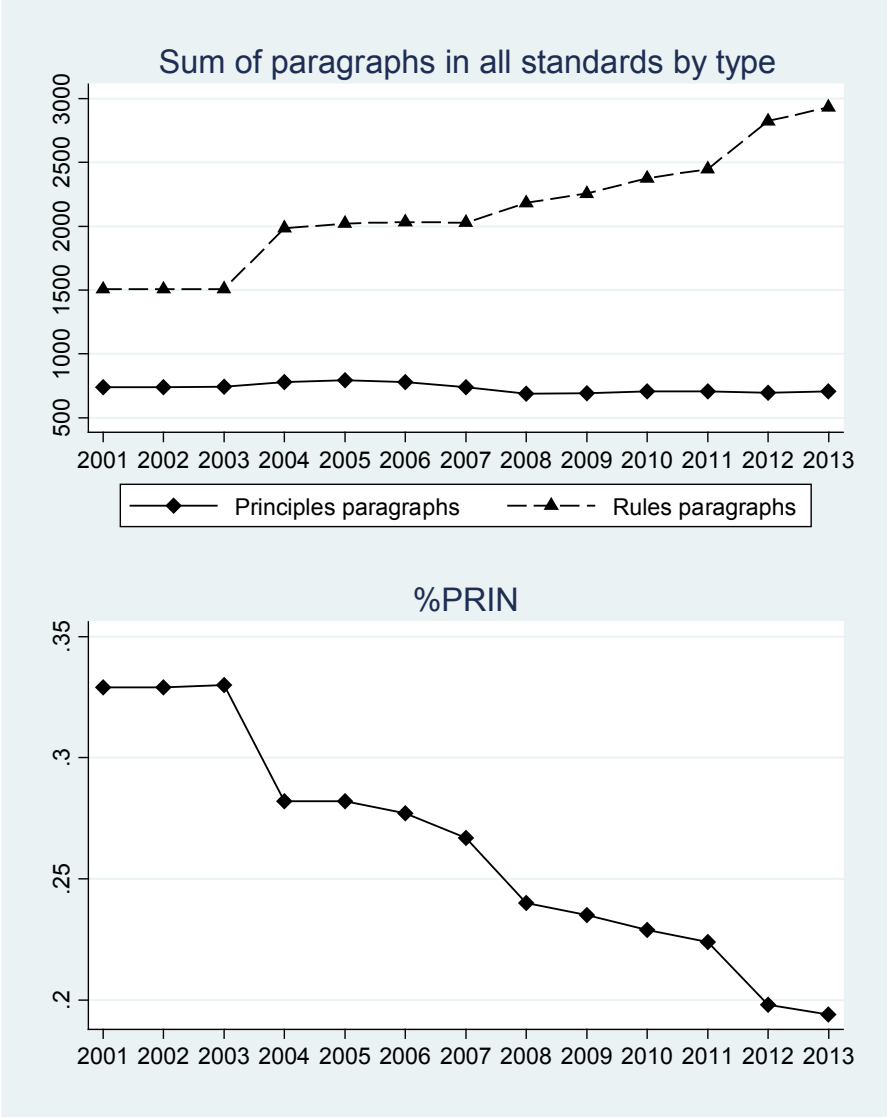


Figure 2: Importance of principles relative to rules



%PRIN is the share of principles paragraphs based on all paragraphs.

Figure 3: Classification of measurement bases

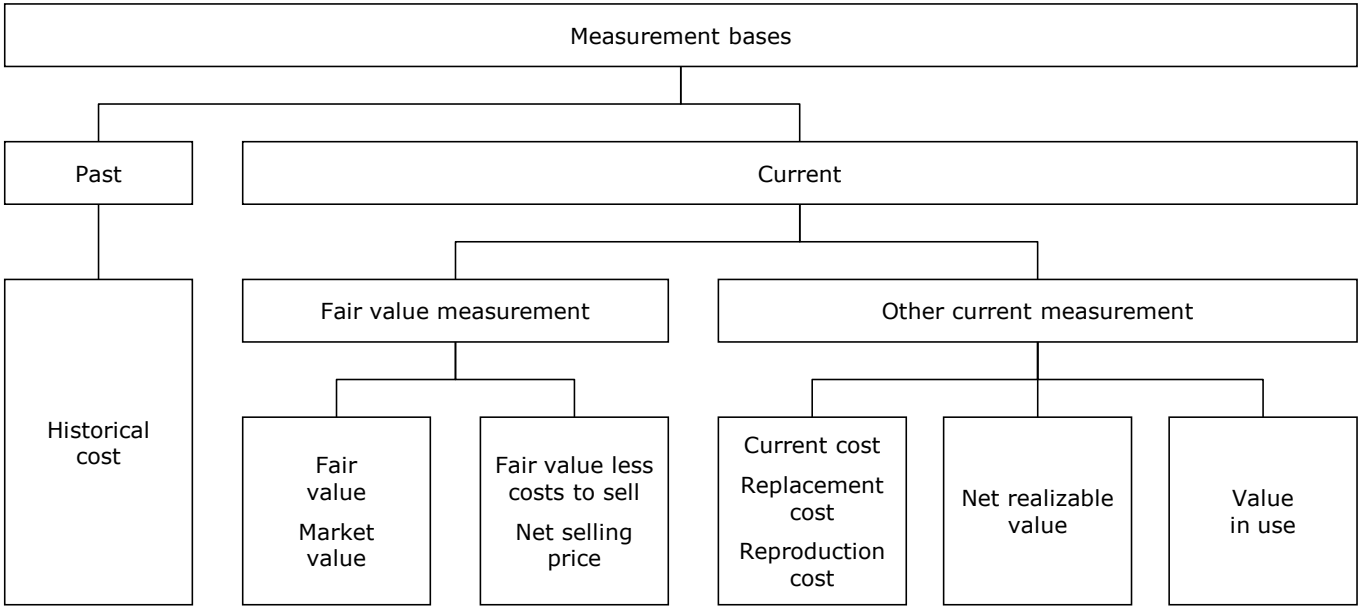
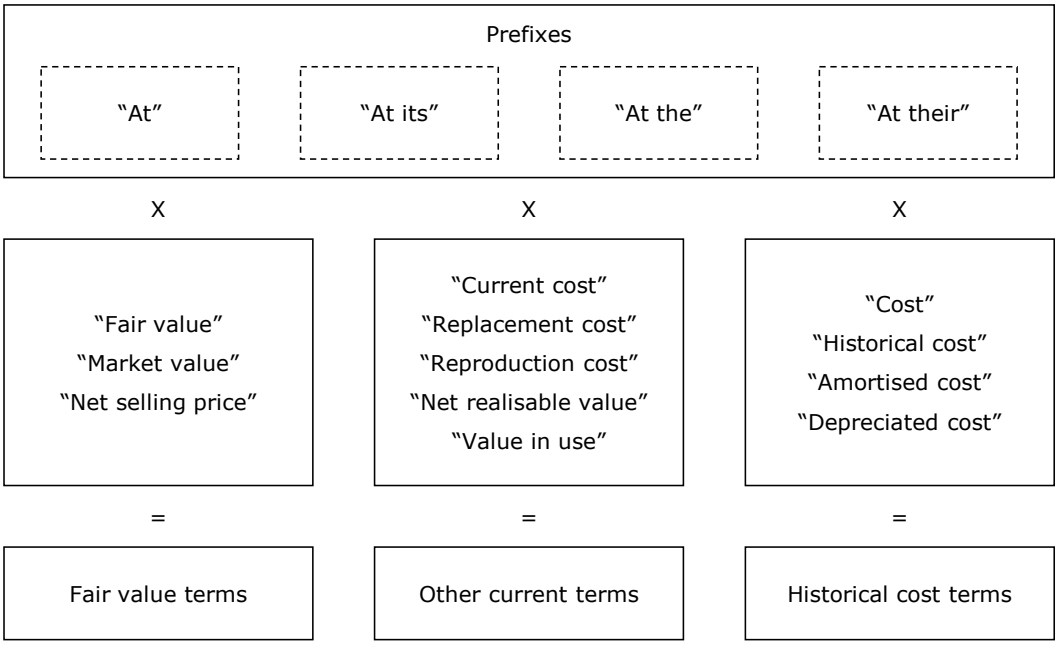
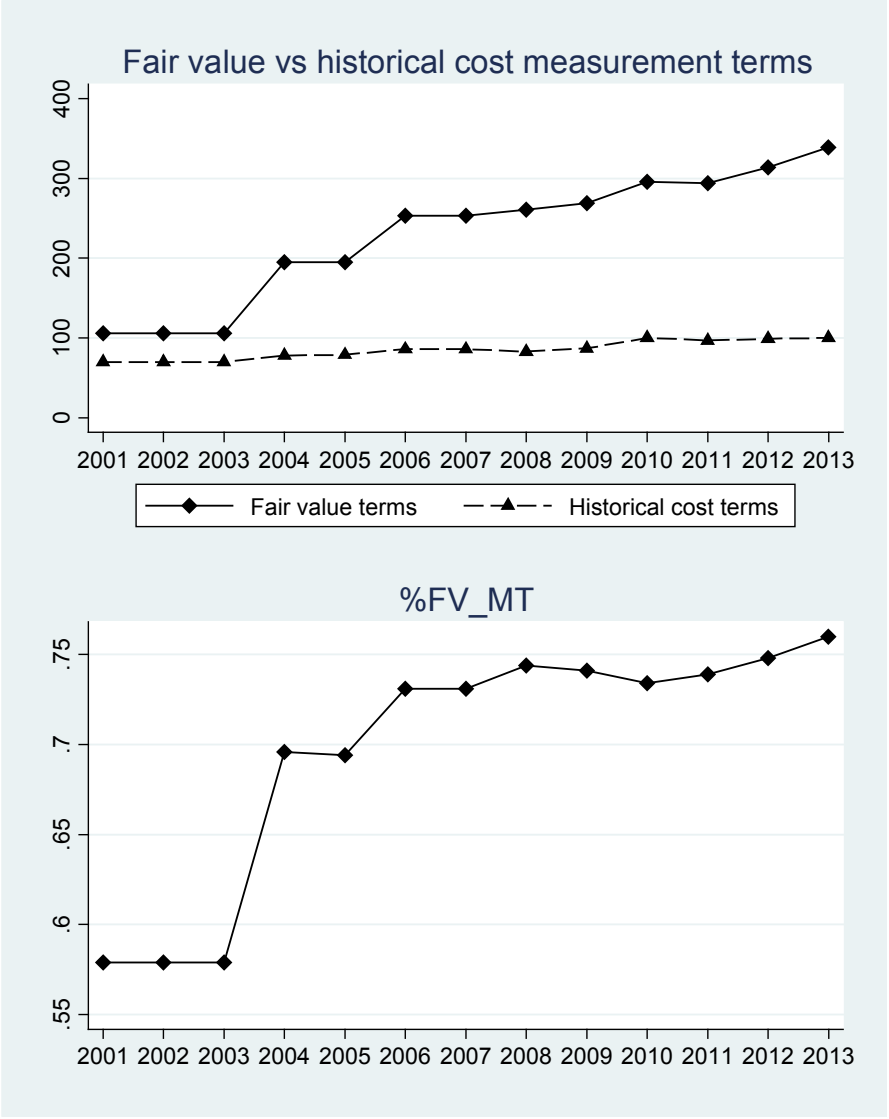


Figure 4: Construction of measurement terms[11]



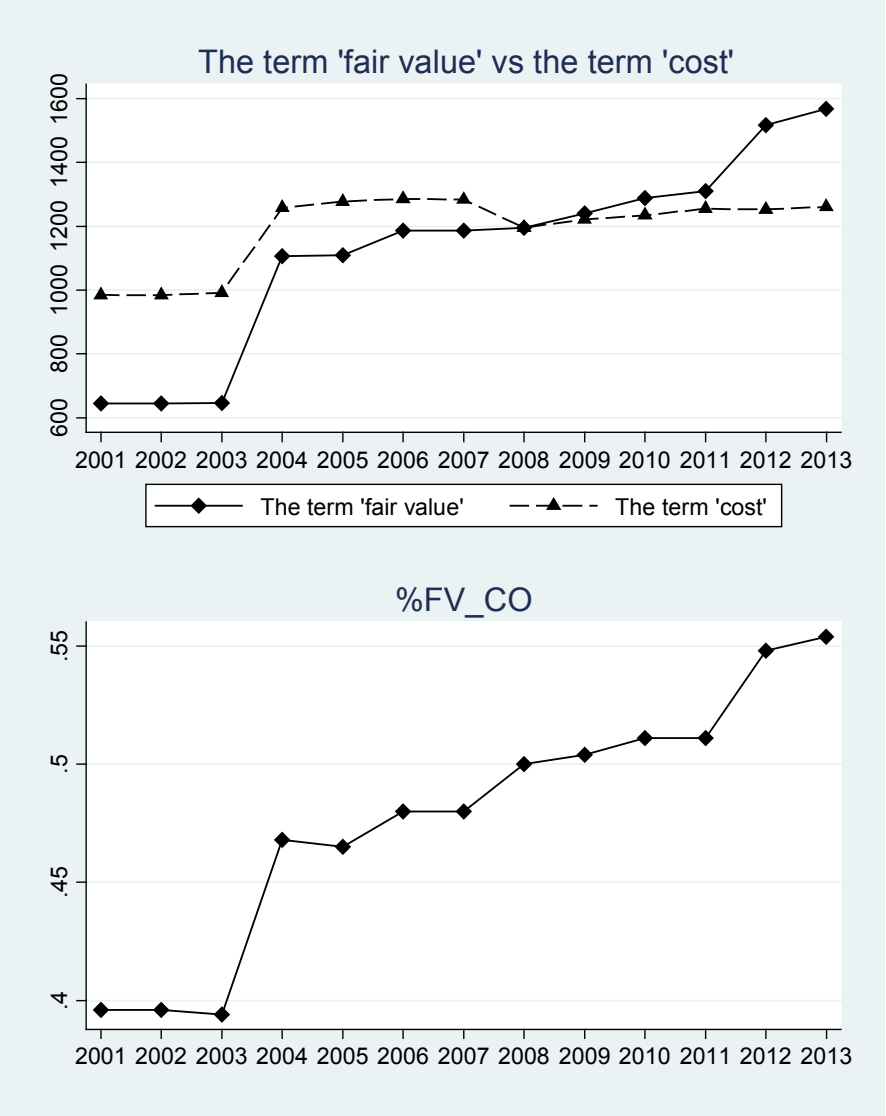
[11] The term "fair value less costs to sell" is not listed as its appearance is covered by searching for "fair value". I search for "amortised cost" and "net realisable value" because these are the British forms of writing used in IFRS.

Figure 5: Fair value orientation based on measurement terms



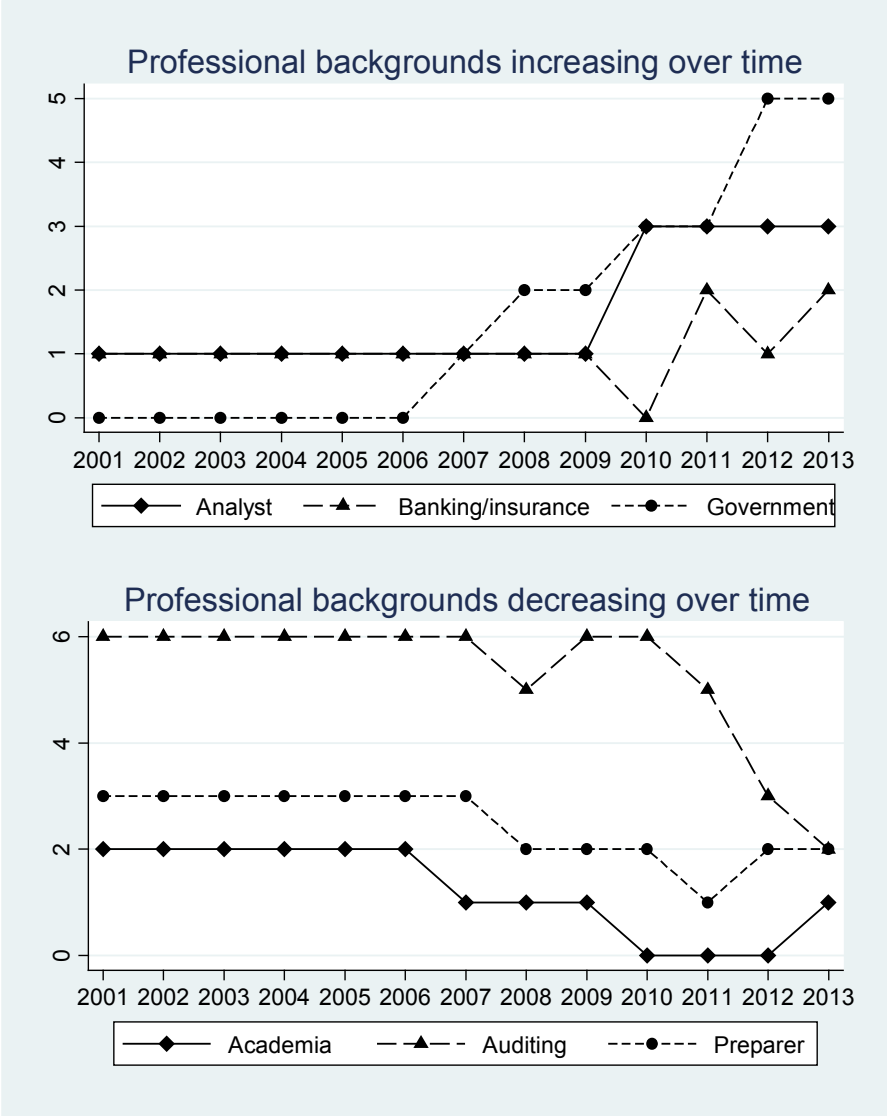
Measurement terms are grouped into fair value terms, other current terms and historical cost terms. Since other current terms are small and constant in their number (7) they are omitted in this figure. Fair value terms are all combinations of the prefixes "at", "at its", "at the", "at their" with the terms "fair value", "market value", "net selling price". Historical cost terms are all combinations of the prefixes "at", "at its", "at the", "at their" with the terms "cost", "historical cost", "amortised cost", "depreciated cost". *%FV_MT* is the share of fair value terms based on all measurement terms.

Figure 6: Fair value orientation based on the terms "fair value" and "cost"



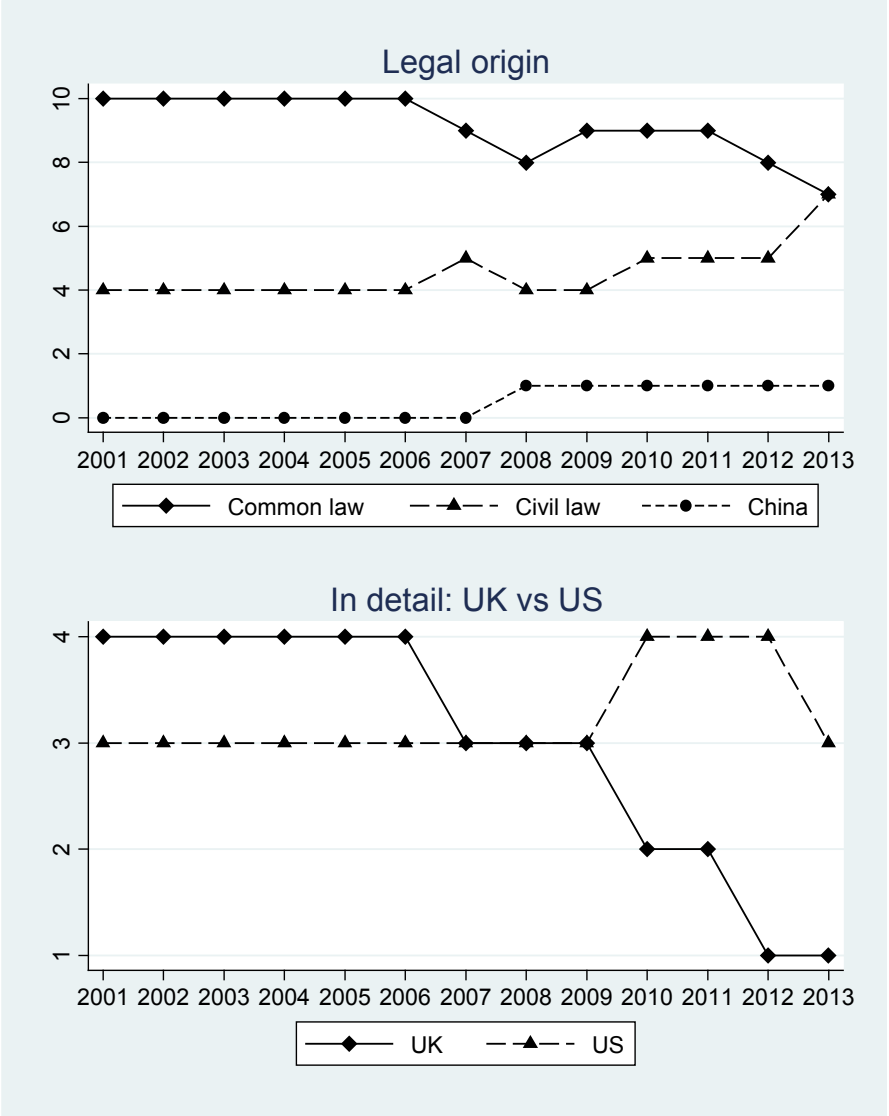
%FV_CO is the frequency of the term "fair value" divided by the sum of the frequencies of the terms "fair value" and "cost".

Figure 7: Professional background of IASB members



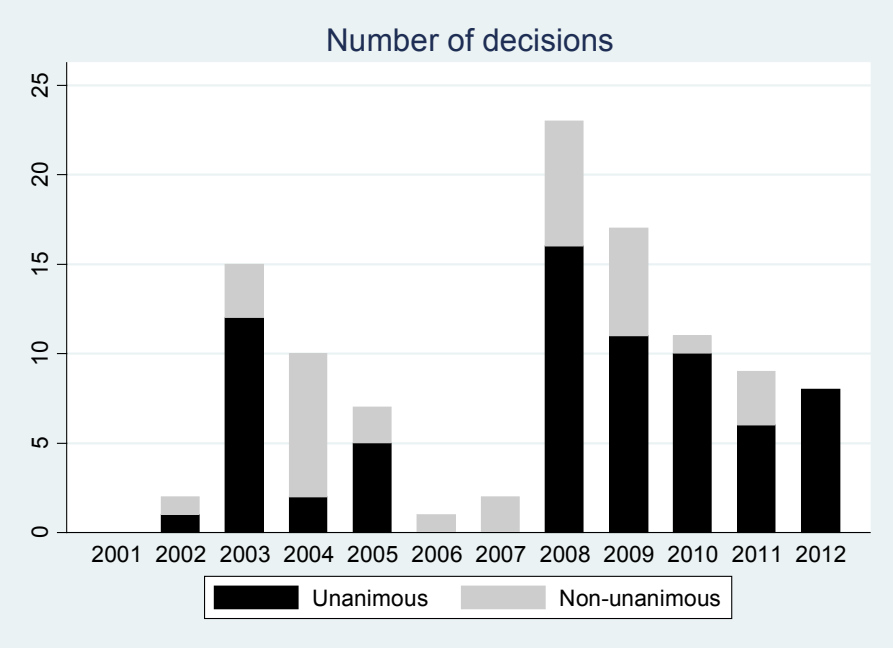
Number of members by January of each year. The professional background of a member is based on his or her last principal occupation outside of standard setting. One member whose professional background is unclear is omitted in this figure.

Figure 8: Cultural background of IASB members



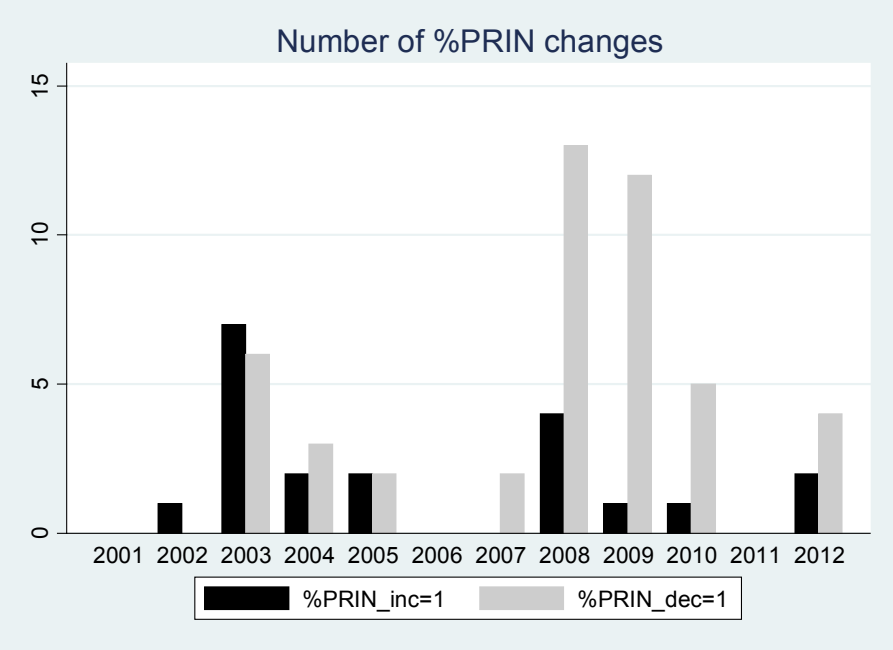
Number of members by January of each year. Cultural background is defined as the legal origin of the company law or commercial code of a member's home country. Common law includes members from Australia, Canada, India, New Zealand, South Africa, United Kingdom, and United States. Civil law includes members from Brazil, France, Germany, Japan, Netherlands, South Korea, Sweden, and Switzerland.

Figure 9: IASB decisions on IFRS changes



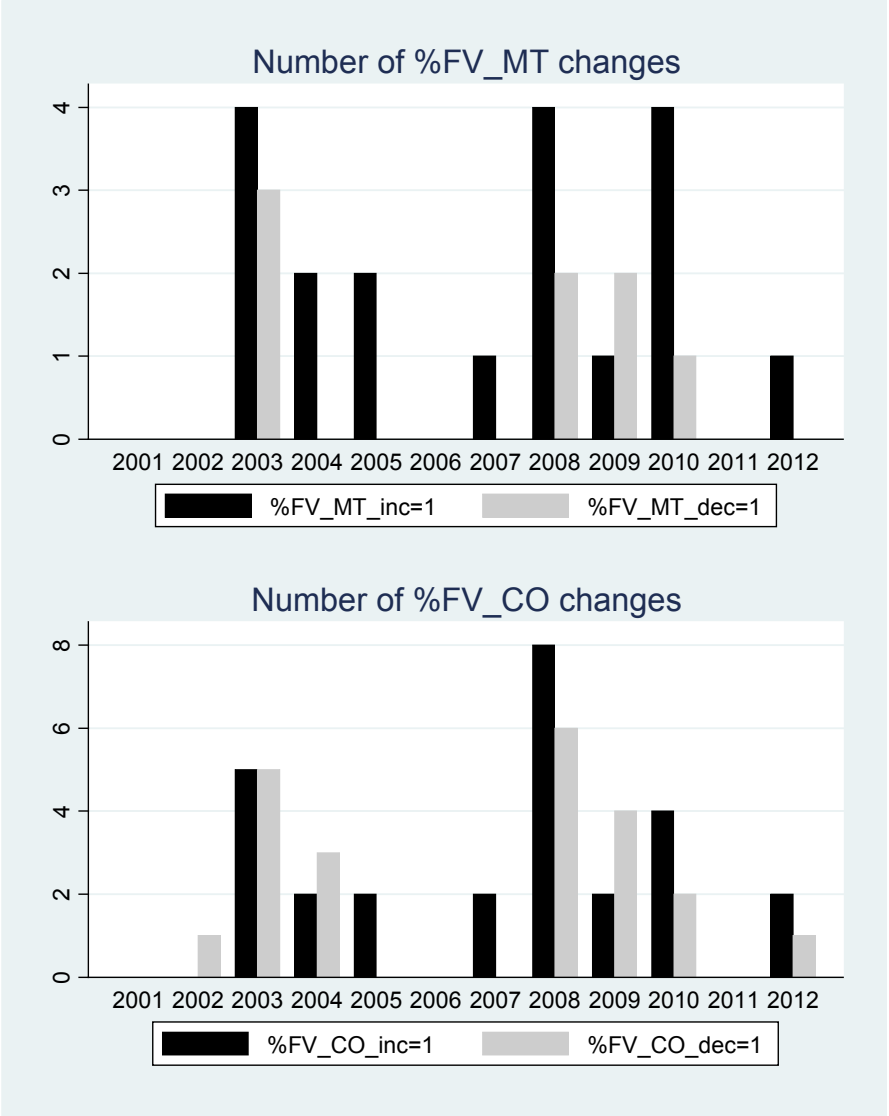
In total 105 decisions. Unanimous approval is defined as a decision being approved without dissenting votes or abstentions. The four improvements projects are split up into 35 decisions with respect to the target standards.

Figure 10: Distribution of IASB decisions in the final sample affecting the importance of principles relative to rules



%PRIN is the share of principles paragraphs based on all paragraphs. *%PRIN_inc* is a dummy variable that equals one if a decision results in an increase in *%PRIN* and zero if not. *%PRIN_dec* is a dummy variable that equals one if a decision results in a decrease in *%PRIN* and zero if not.

Figure 11: Distribution of IASB decisions in the final sample affecting fair value orientation



%FV_MT is the share of fair value measurement terms based on all measurement terms. *%FV_MT_inc* is a dummy variable that equals one if a decision results in an increase in *%FV_MT* and zero if not. *%FV_MT_dec* is a dummy variable that equals one if a decision results in a decrease in *%FV_MT* and zero if not. *%FV_CO* is the frequency of the term "fair value" divided by the sum of the frequencies of the terms "fair value" and "cost". *%FV_CO_inc* is a dummy variable that equals one if a decision results in an increase in *%FV_CO* and zero if not. *%FV_CO_dec* is a dummy variable that equals one if a decision results in a decrease in *%FV_CO* and zero if not.

Table 1: Size of the IFRS universe

Year	IFRS as issued at	Number of standards	Words	Words per standard
2001	Jan 1	34	202,217	5,948
2002	Jan 1	34	204,167	6,005
2003	Jan 1	34	205,611	6,047
2004	Mar 31	36	267,391	7,428
2005	Jan 1	37	268,491	7,257
2006	Jan 1	37	274,643	7,423
2007	Jan 1	37	270,888	7,321
2008	Jan 17	37	282,307	7,630
2009	Jan 1	37	290,341	7,847
2010	Jan 1	38	300,574	7,910
2011	Jan 1	38	308,338	8,114
2012	Jan 1	41	345,780	8,434
2013	Jan 1	41	354,405	8,644
Δ	—	+20.6%	+75.3%	+45.3%

Table 2: Importance of principles relative to rules

Year	IFRS as issued at	Principles paragraphs	Rules paragraphs	*%PRIN*
2001	Jan 1	740	1,507	0.329
2002	Jan 1	740	1,507	0.329
2003	Jan 1	742	1,508	0.330
2004	Mar 31	778	1,985	0.282
2005	Jan 1	794	2,022	0.282
2006	Jan 1	780	2,034	0.277
2007	Jan 1	738	2,029	0.267
2008	Jan 17	688	2,184	0.240
2009	Jan 1	693	2,257	0.235
2010	Jan 1	707	2,376	0.229
2011	Jan 1	708	2,448	0.224
2012	Jan 1	696	2,825	0.198
2013	Jan 1	707	2,933	0.194
Δ	—	–4.5%	+94.6%	–41.0%

%PRIN is the share of principles paragraphs based on all paragraphs.

Table 3: Fair value orientation based on measurement terms

Year	IFRS as issued at	Number of standards	Standards w/ measurement terms	Standards w/ fair value terms	Fair value terms	Other current terms	Historical cost terms	*%FV_MT*
2001	Jan 1	34	25	20	106	7	70	0.579
2002	Jan 1	34	25	20	106	7	70	0.579
2003	Jan 1	34	25	20	106	7	70	0.579
2004	Mar 31	36	30	26	195	7	78	0.696
2005	Jan 1	37	31	26	195	7	79	0.694
2006	Jan 1	37	31	26	253	7	86	0.731
2007	Jan 1	37	31	26	253	7	86	0.731
2008	Jan 17	37	32	28	261	7	83	0.744
2009	Jan 1	37	32	29	269	7	87	0.741
2010	Jan 1	38	33	30	296	7	100	0.734
2011	Jan 1	38	34	31	294	7	97	0.739
2012	Jan 1	41	37	33	314	7	99	0.748
2013	Jan 1	41	38	35	339	7	100	0.760
Δ	—	+20.6%	+52.0%	+75.0%	+219.8%	0.0%	+42.9%	+31.3%

Measurement terms are grouped into fair value terms, other current terms and historical cost terms. Fair value terms are all combinations of the prefixes “at”, “at its”, “at the”, “at their” with the terms “fair value”, “market value”, “net selling price”. Other current terms are all combinations of the prefixes “at”, “at its”, “at their”, “at the” with the terms “current cost”, “replacement cost”, “reproduction cost”, “net realisable value”, “value in use”. Historical cost terms are all combinations of the prefixes “at”, “at its”, “at the”, “at their” with the terms “cost”, “historical cost”, “amortised cost”, “depreciated cost”. *%FV_MT* is the share of fair value terms based on all measurement terms.

Table 4: Fair value orientation based on the terms "fair value" and "cost"

Year	IFRS as issued at	Number of standards	Standards w/ "fair value" or "cost"	Standards w/ "fair value"	"Fair value"	"Cost"	*%FV_CO*
2001	Jan 1	34	34	22	645	985	0.396
2002	Jan 1	34	34	22	644	984	0.396
2003	Jan 1	34	34	22	646	992	0.394
2004	Mar 31	36	36	27	1,107	1,258	0.468
2005	Jan 1	37	37	27	1,109	1,278	0.465
2006	Jan 1	37	37	27	1,186	1,286	0.480
2007	Jan 1	37	37	27	1,186	1,284	0.480
2008	Jan 17	37	37	29	1,195	1,196	0.500
2009	Jan 1	37	37	30	1,241	1,222	0.504
2010	Jan 1	38	38	31	1,289	1,235	0.511
2011	Jan 1	38	38	32	1,311	1,255	0.511
2012	Jan 1	41	41	35	1,517	1,253	0.548
2013	Jan 1	41	41	37	1,568	1,261	0.554
Δ	—	+20.6%	+20.6%	+68.2%	+143.1%	+28.0%	+39.9%

%FV_CO is the frequency of the term "fair value" divided by the sum of the frequencies of the terms "fair value" and "cost".

Table 5: Development of the IASB structure as defined by the constitution of the IFRS Foundation

Time period	Members	Of that: part-time	Majority for approving IFRS	Main qualification for membership	Quota for professional background	Quota for geographical background
2000-05 – 2005-06	14	2	8	"Technical expertise"	Min. 5 auditing, 3 preparer, 3 user, 1 academia	—
2005-06 – 2009-01	14	2	9	"Professional competence and practical experience"	—	—
2009-01 – 2012-06	14–16	Max. 3	10 (if less than 16 members: 9)	"Professional competence and practical experience"	—	—
From 2012-07	16	Max. 3	10	"Professional competence and practical experience"	—	Min. 4 Asia/Oceania, 4 Europe, 4 North America, 1 Africa, 1 South America

Table 6: List of all 33 IASB members between 2001 and 2013

Name	Joining IASB	Leaving IASB	Home country	Last principal occupation was standard setting?	Last principal occupation outside of standard setting	Professional background
Barth, Mary E.	2001-01	2009-06	US	No	Stanford University, Professor of Accounting	Academia
Bruns, Hans-Georg	2001-01	2007-06	DE	No	DaimlerChrysler, Chief Accounting Officer	Preparer
Cooper, Steven	2007-07	—	UK	No	UBS Investment Bank, Managing Director and Head of Valuation and Accounting Research	Analyst
Cope, Anthony T.	2001-01	2007-06	UK	Yes: U.S. FASB, Member	Wellington Management Co, Director of Fixed Income Research	Analyst
Danjou, Philippe	2006-07	—	FR	No	Autorité des Marchés Financiers, Director of the Accounting Division	Government
Edelmann, Martin	2012-07	—	DE	No	Deutsche Bank AG, Head of Group Reporting	Banking/ insurance
Engström, Jan	2004-05	—	SE	No	Volvo Bus Corporation, Chief Executive Officer	Preparer
Finnegan, Patrick	2009-07	—	US	No	CFA Institute Centre for Financial Market Integrity, Director of Financial Reporting Policy Group	Analyst
Garnett, Robert P.	2001-01	2010-06	ZA	No	Anglo American plc, Executive Vice President of Finance	Preparer
Gélard, Gilbert	2001-01	2010-06	FR	No	KPMG, Partner	Auditing
Gomes, Amaro Luiz de Oliviera	2009-07	—	BR	No	Central Bank of Brazil, Head of Financial System Regulation Department	Government

(Table 6: continued)

Name	Joining IASB	Leaving IASB	Home country	Last principal occupation was standard setting?	Last principal occupation outside of standard setting	Professional background
Herz, Robert H.	2001-01	2002-06	US	No	PwC, Partner	Auditing
Hoogervorst, Hans	2011-07	—	NL	No	Netherlands Authority for the Financial Market, Chairman	Government
Jones, Thomas E.	2001-01	2009-06	UK	No	Citicorp, Principal Financial Officer	Banking/ insurance
Kabureck, Gary	2013-04	—	US	No	Xerox Corporation, Chief Accounting Officer	Preparer
Kalavacherla, Prabhakar	2009-01	—	IN	No	KPMG, Audit Partner	Auditing
König, Elke	2010-07	2011-12	DE	No	Hannover Re Group, Chief Financial Officer	Banking/ insurance
Leisenring, James J.	2001-01	2010-06	US	Yes: U.S. FASB, Director of International Activities	Bristol, Leisenring, Herkner & Co, Partner and Director of Accounting and Auditing	Auditing
Mackintosh, Ian	2011-07	—	NZ	Yes: UK ASB, Chairman	World Bank, Financial Management South Asia	Government
McConnell, Patricia	2009-07	—	US	No	Bear Stearns & Co, Equity Research, Accounting and Tax Policy Analyst	Analyst
McGregor, Warren J.	2001-01	2011-06	AU	No	Stevenson McGregor, Director	Unclear
Ochi, Takatsugu	2011-07	—	JP	No	Sumitomo Corporation, Financial Resources Management Group, Assistant General Manager	Preparer
O'Malley, Patricia	2001-01	2007-06	CA	Yes: ASB of Canada, Chair	KPMG, Technical Partner	Auditing

(Table 6: continued)

Name	Joining IASB	Leaving IASB	Home country	Last principal occupation was standard setting?	Last principal occupation outside of standard setting	Professional background
Pacter, Paul	2010-07	2012-11	US	Yes: IASB, Director of Standards for SMEs	Deloitte Touche Tohmatsu, Global IFRS Office, Director	Auditing
Schmid, Harry K.	2001-01	2004-03	CH	No	Nestlé, Senior Vice President	Preparer
Scott, Darrel	2010-10	—	ZA	No	FirstRand Banking Group, Chief Financial Officer	Banking/ insurance
Smith, John T.	2002-09	2012-06	US	No	Deloitte & Touche, Partner	Auditing
Suh, Chung Woo	2012-07	—	KR	No	Kookmin University, Professor of Accounting	Academia
Tokar, Mary	2013-01	—	US	No	KPMG, International Financial Reporting Group	Auditing
Tweedie, Sir David	2001-01	2011-06	UK	Yes: UK ASB, Chairman	KPMG, Partner	Auditing
Whittington, Geoffrey	2001-01	2006-06	UK	No	Cambridge University, Professor of Financial Accounting	Academia
Yamada, Tatsumi	2001-01	2011-06	JP	No	ChuoAoyama Audit Corporation, Partner	Auditing
Zhang, Wei-Guo	2007-07	—	CN	No	China Securities Regulatory Commission, Department of International Affairs, Chief Accountant and Director General	Government

There can be a time difference between being appointed to the IASB and joining the IASB. Home country codes: AU: Australia, BR: Brazil, CA: Canada, CH: Switzerland, CN: China, DE: Germany, FR: France, IN: India, JP: Japan, KR: South Korea, NL: Netherlands, NZ: New Zealand, SE: Sweden, UK: United Kingdom, US: United States, ZA: South Africa.

Table 7: Development of the professional background of IASB members

Year	Month	Members	Standard setting as last principal occupation	Professional background (last principal occupation outside of standard setting)						
				Academia	Analyst	Auditing	Banking/ insurance	Government	Preparer	Unclear
2001	Jan	14	4	2	1	6	1	0	3	1
2002	Jan	14	4	2	1	6	1	0	3	1
2003	Jan	14	4	2	1	6	1	0	3	1
2004	Jan	14	4	2	1	6	1	0	3	1
2005	Jan	14	4	2	1	6	1	0	3	1
2006	Jan	14	4	2	1	6	1	0	3	1
2007	Jan	14	4	1	1	6	1	1	3	1
2008	Jan	13	2	1	1	5	1	2	2	1
2009	Jan	14	2	1	1	6	1	2	2	1
2010	Jan	15	2	0	3	6	0	3	2	1
2011	Jan	15	2	0	3	5	2	3	1	1
2012	Jan	14	2	0	3	3	1	5	2	0
2013	Jan	15	1	1	3	2	2	5	2	0

Table 8: Development of the cultural background of IASB members

Year	Month	Members	Common law			Civil law			China
			UK	U.S.	Other countries	French type	German type	Scandinavian type	
2001	Jan	14	4	3	3	1	3	0	0
2002	Jan	14	4	3	3	1	3	0	0
2003	Jan	14	4	3	3	1	3	0	0
2004	Jan	14	4	3	3	1	3	0	0
2005	Jan	14	4	3	3	1	2	1	0
2006	Jan	14	4	3	3	1	2	1	0
2007	Jan	14	3	3	3	2	2	1	0
2008	Jan	13	3	3	2	2	1	1	1
2009	Jan	14	3	3	3	2	1	1	1
2010	Jan	15	2	4	3	3	1	1	1
2011	Jan	15	2	4	3	2	2	1	1
2012	Jan	14	1	4	3	3	1	1	1
2013	Jan	15	1	3	3	3	3	1	1

Cultural background is defined as the legal origin of the company law or commercial code of a member's home country. Other countries of common law includes members from Australia, Canada, India, New Zealand, and South Africa. French civil law includes members from Brazil, France, and Netherlands. German civil law includes members from Germany, Japan, South Korea, and Switzerland. Scandinavian civil law includes members from Sweden.

Table 9: IASB decisions on IFRS changes

Year	Decisions on IFRS changes	Share of unanimous approval	Type of decisions			
			Issuances of standards	Revisions of standards	Amendments to standards	Improvements projects
2001	0	—	—	—	—	—
2002	2	0.500	—	1	1	—
2003	15	0.800	1	14	—	—
2004	10	0.200	5	2	3	—
2005	7	0.714	1	—	6	—
2006	1	0.000	1	—	—	—
2007	2	0.000	—	2	—	—
2008	23	0.696	—	3	6	14
2009	17	0.647	1	1	5	10
2010	11	0.909	1	—	4	6
2011	9	0.667	4	1	4	—
2012	8	1.000	—	—	3	5
Total	105	0.676	14	24	32	35

Unanimous approval is defined as a decision being approved without dissenting votes or abstentions. The four improvements projects are split up into 35 decisions with respect to the target standards.

Table 10: Sample development

IASB decisions on IFRS changes between 2001 and 2012	105
Decisions issuing new standards are removed	–13
Multiple decisions targeting a standard within a year are collapsed into a pseudo decision (24 decisions collapsed into 10 pseudo decisions)	–14
Decisions targeting IAS 39 (Financial Instruments: Recognition and Measurement) after 2008 and the 2010 re-issuance of IFRS 9 (Financial Instruments) are removed due to the step-by-step introduction of IFRS 9	–2
All decisions in 2011 are removed due to the issuance of IFRS 13 (Fair Value Measurement)	–5
Final sample	71

Table 11: Summary statistics of final sample

Variable	N	Mean	S.D.	Min	Median	Max
%PRIN_inc	71	0.282				
%PRIN_dec	71	0.662				
%FV_MT_inc	71	0.268				
%FV_MT_dec	71	0.113				
%FV_CO_inc	71	0.380				
%FV_CO_dec	71	0.310				
%Auditing	71	0.392	0.074	0.154	0.400	0.545
%Financial	71	0.170	0.052	0.077	0.154	0.333
%Common	71	0.640	0.067	0.500	0.615	0.889

%PRIN is the share of principles paragraphs based on all paragraphs. *%PRIN_inc* is a dummy variable that equals one if a decision results in an increase in *%PRIN* and zero if not. *%PRIN_dec* is a dummy variable that equals one if a decision results in a decrease in *%PRIN* and zero if not. *%FV_MT* is the share of fair value measurement terms based on all measurement terms. *%FV_MT_inc* is a dummy variable that equals one if a decision results in an increase in *%FV_MT* and zero if not. *%FV_MT_dec* is a dummy variable that equals one if a decision results in a decrease in *%FV_MT* and zero if not. *%FV_CO* is the frequency of the term "fair value" divided by the sum of the frequencies of the terms "fair value" and "cost". *%FV_CO_inc* is a dummy variable that equals one if a decision results in an increase in *%FV_CO* and zero if not. *%FV_CO_dec* is a dummy variable that equals one if a decision results in a decrease in *%FV_CO* and zero if not. *%Auditing* is the share of IASB members approving a change whose last principal occupation outside of standard setting was in the auditing industry. *%Financial* is the share of IASB members approving a change whose last principal occupation outside of standard setting was in financial services, i.e. the analyst, banking or insurance industry. *%Common* is the share of IASB members approving a change who are from countries in which the legal origin of the company law or commercial code is common law.

Table 12: Pearson correlations (below the diagonal) and Spearman correlations (above the diagonal)

N=71	*%PRIN_inc*	*%PRIN_dec*	*%FV_MT_inc*	*%FV_MT_dec*	*%FV_CO_inc*	*%FV_CO_dec*	*%Auditing*	*%Financial*	*%Common*
%PRIN_inc	X	**–0.876 (0.000)**	–0.166 (0.166)	0.173 (0.149)	–0.104 (0.390)	0.054 (0.653)	–0.067 (0.581)	–0.053 (0.662)	**0.215 (0.071)**
%PRIN_dec	**–0.876 (0.000)**	X	0.163 (0.175)	–0.122 (0.311)	0.130 (0.278)	0.028 (0.816)	0.083 (0.492)	0.037 (0.757)	–0.195 (0.103)
%FV_MT_inc	–0.166 (0.166)	0.163 (0.175)	X	**–0.215 (0.071)**	**0.575 (0.000)**	**–0.199 (0.097)**	0.167 (0.163)	0.058 (0.634)	–0.001 (0.995)
%FV_MT_dec	0.173 (0.149)	–0.122 (0.311)	**–0.215 (0.071)**	X	–0.096 (0.428)	**0.339 (0.004)**	0.030 (0.803)	–0.103 (0.393)	0.112 (0.352)
%FV_CO_inc	–0.104 (0.390)	0.130 (0.278)	**0.575 (0.000)**	–0.096 (0.428)	X	**–0.525 (0.000)**	0.177 (0.139)	0.077 (0.522)	–0.110 (0.360)
%FV_CO_dec	0.054 (0.653)	0.028 (0.816)	**–0.199 (0.097)**	**0.339 (0.004)**	**–0.525 (0.000)**	X	–0.079 (0.515)	–0.077 (0.522)	0.138 (0.250)
%Auditing	–0.077 (0.525)	0.061 (0.616)	0.137 (0.254)	0.081 (0.502)	0.123 (0.307)	0.008 (0.947)	X	**–0.647 (0.000)**	**0.408 (0.000)**
%Financial	–0.061 (0.613)	0.074 (0.537)	0.052 (0.669)	–0.108 (0.370)	0.083 (0.492)	–0.104 (0.386)	**–0.773 (0.000)**	X	**–0.576 (0.000)**
%Common	**0.200 (0.094)**	–0.184 (0.125)	0.073 (0.543)	0.079 (0.513)	–0.067 (0.580)	0.109 (0.364)	**0.373 (0.001)**	**–0.347 (0.003)**	X

%PRIN is the share of principles paragraphs based on all paragraphs. *%PRIN_inc* is a dummy variable that equals one if a decision results in an increase in *%PRIN* and zero if not. *%PRIN_dec* is a dummy variable that equals one if a decision results in a decrease in *%PRIN* and zero if not. *%FV_MT* is the share of fair value measurement terms based on all measurement terms. *%FV_MT_inc* is a dummy variable that equals one if a decision results in an increase in *%FV_MT* and zero if not. *%FV_MT_dec* is a dummy variable that equals one if a decision results in a decrease in *%FV_MT* and zero if not. *%FV_CO* is the frequency of the term "fair value" divided by the sum of the frequencies of the terms "fair value" and "cost". *%FV_CO_inc* is a dummy variable that equals one if a decision results in an increase in *%FV_CO* and zero if not. *%FV_CO_dec* is a dummy variable that equals one if a decision results in a decrease in *%FV_CO* and zero if not. *%Auditing* is the share of IASB members approving a change whose last principal occupation outside of standard setting was in the auditing industry. *%Financial* is the share of IASB members approving a change whose last principal occupation outside of standard setting was in financial services, i.e. the analyst, banking or insurance industry. *%Common* is the share of IASB members approving a change who are from countries in which the legal origin of the company law or commercial code is common law. P-values are provided in braces. Bold entries indicate significance at the 10% level or lower.

Table 13: Changes in the importance of principles relative to rules using probit regressions

Dependent	Prob(*%PRIN_inc*=1)		Prob(*%PRIN_dec*=1)	
Model	(1)	(2)	(3)	(4)
Constant	3.860 (2.484)	0.954 (–2.778)	–3.598 (2.309)	–1.042 (2.647)
%Auditing	**–7.069*** **(4.087)**	**–9.012**** **(4.586)**	**6.287*** **(3.803)**	**7.777*** **(4.112)**
%Financial	**–10.059*** **(5.968)**	–9.558 (6.150)	**9.304*** **(5.535)**	8.703 (5.618)
%Common	—	**5.547*** **(2.896)**	—	**–4.721*** **(2.712)**
LR ChiSq	3.549	7.573	3.306	6.477
Prob>ChiSq	0.170	0.056	0.192	0.091
N(Dependent=1)	20	20	47	47
N(Dependent=0)	51	51	24	24
N	71	71	71	71

%PRIN is the share of principles paragraphs based on all paragraphs. *%PRIN_inc* is a dummy variable that equals one if a decision results in an increase in *%PRIN* and zero if not. *%PRIN_dec* is a dummy variable that equals one if a decision results in a decrease in *%PRIN* and zero if not. *%Auditing* is the share of IASB members approving a change whose last principal occupation outside of standard setting was in the auditing industry. *%Financial* is the share of IASB members approving a change whose last principal occupation outside of standard setting was in financial services, i.e. the analyst, banking or insurance industry. *%Common* is the share of IASB members approving a change who are from countries in which the legal origin of the company law or commercial code is common law. Standard errors are provided in braces. Bold entries and ***/**/* indicate significance at the 1%/5%/10% level.

Table 14: Changes in fair value orientation based on measurement terms using probit regressions

Dependent	Prob(*%FV_MT_inc*=1)		Prob(*%FV_MT_dec*=1)	
Model	(5)	(6)	(7)	(8)
Constant	**–5.142**** **(2.128)**	**–5.644**** **(2.665)**	–0.437 (2.766)	–1.223 (3.280)
%Auditing	**7.484**** **(3.563)**	**7.251**** **(3.607)**	0.009 (4.650)	–0.272 (4.763)
%Financial	**9.196*** **(4.939)**	**9.349*** **(5.004)**	–4.797 (6.818)	–4.577 (6.846)
%Common	—	0.887 (2.603)	—	1.335 (3.151)
LR ChiSq	5.192	5.304	1.069	1.229
Prob>ChiSq	0.075	0.151	0.586	0.746
N(Dependent=1)	19	19	8	8
N(Dependent=0)	52	52	63	63
N	71	71	71	71

%FV_MT is the share of fair value measurement terms based on all measurement terms. *%FV_MT_inc* is a dummy variable that equals one if a decision results in an increase in *%FV_MT* and zero if not. *%FV_MT_dec* is a dummy variable that equals one if a decision results in a decrease in *%FV_MT* and zero if not. *%Auditing* is the share of IASB members approving a change whose last principal occupation outside of standard setting was in the auditing industry. *%Financial* is the share of IASB members approving a change whose last principal occupation outside of standard setting was in financial services, i.e. the analyst, banking or insurance industry. *%Common* is the share of IASB members approving a change who are from countries in which the legal origin of the company law or commercial code is common law. Standard errors are provided in braces. Bold entries and ***/**/* indicate significance at the 1%/5%/10% level.

Table 15: Changes in fair value orientation based on the terms "fair value" and "cost" using probit regressions

Dependent	Prob(*%FV_CO_inc*=1)		Prob(*%FV_CO_dec*=1)	
Model	(9)	(10)	(11)	(12)
Constant	**–5.642*** (2.187)**	**–4.419* (2.601)**	2.181 (2.218)	0.856 (2.613)
%Auditing	**8.527** (3.609)**	**9.118** (3.668)**	–3.776 (3.665)	–4.404 (3.789)
%Financial	**11.734** (5.155)**	**11.368** (5.134)**	–7.148 (5.336)	–6.742 (5.345)
%Common	—	–2.182 (2.543)	—	2.340 (2.596)
LR ChiSq	6.724	7.436	1.893	2.650
Prob>ChiSq	0.035	0.059	0.388	0.449
N(Dependent=1)	27	27	22	22
N(Dependent=0)	44	44	49	49
N	71	71	71	71

%FV_CO is the frequency of the term "fair value" divided by the sum of the frequencies of the terms "fair value" and "cost". *%FV_CO_inc* is a dummy variable that equals one if a decision results in an increase in *%FV_CO* and zero if not. *%FV_CO_dec* is a dummy variable that equals one if a decision results in a decrease in *%FV_CO* and zero if not. *%Auditing* is the share of IASB members approving a change whose last principal occupation outside of standard setting was in the auditing industry. *%Financial* is the share of IASB members approving a change whose last principal occupation outside of standard setting was in financial services, i.e. the analyst, banking or insurance industry. *%Common* is the share of IASB members approving a change who are from countries in which the legal origin of the company law or commercial code is common law. Standard errors are provided in braces. Bold entries and ***/**/* indicate significance at the 1%/5%/10% level.

II

Enforcement of Accounting Standards and Changes in Corporate Governance

Marcus Witzky

Abstract

This paper investigates (1) whether the corporate governance of firms with erroneous financial reporting differs systematically from that of non-error firms and (2) whether error detection is followed by improvements in the corporate governance of error firms. I apply a difference-in-differences approach on a matched sample from Germany. In contrast to the U.S., firms are selected randomly and repeatedly for examination under the German financial reporting enforcement regime. For the error year, I find error firms less likely to be audited by a big-four firm, to have an unqualified auditor's opinion, and to have an audit committee. They are subject to a more time-consuming auditing process and their supervisory boards have fewer members and committees. In the first full fiscal year after error disclosure, differences between error and control firms are insignificant for the structure of the supervisory board but partly persist with respect to the auditor-client relationship. This may be interpreted as financial reporting enforcement being effective to some extent in preventing potential future errors by triggering improvements in firm-level accounting oversight.

Keywords: Enforcement, Accounting Errors, Error Announcements, Financial Reporting, Corporate Governance, Supervisory Board, Auditor-client Relationship

JEL Classification: G34, K42, M40, M41, M48

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1 Introduction

Prior literature suggests that enforcement of accounting standards matters for the quality of financial reporting (see Dechow, Ge, and Schrand 2010 for an overview). Potentially, the quality of corporate governance represents a mechanism in this relationship. I define corporate governance as the structure of the internal and external accounting oversight institutions at the firm level or, more specifically, of the board of directors and the auditor-client relationship. In this regard, I add to the understanding of potential determinants of erroneous financial reporting and of potential consequences of financial reporting enforcement actions. Using a difference-in-differences approach on a matched sample from Germany, I investigate (1) whether the corporate governance of error firms differs systematically from that of non-error firms and (2) whether error detection is followed by improvements in the corporate governance of error firms.

Erroneous financial reporting can result either from differential judgment on implicit accounting choices between management and enforcement bodies or from—intentional or unintentional—errors during the preparation of the financial reporting by the management. The latter case might hint at the inability or unwillingness of the responsible firm-level oversight institutions to perform their duties. For example, Jensen (1993) argues that problems in a firm's internal control system are induced by failures at the level of the board of directors. For listed firms, the internal oversight of the accounting process by the board of directors is complemented by an audit of the financial reporting as external verification mechanism. Thus, undetected material errors in the financial reporting could be interpreted as a failure of both the internal and external accounting oversight mechanisms. Consequently, it is interesting whether the detection of erroneous financial reporting will result in improvements of accounting oversight mechanisms. If not, this would question the effectiveness of financial reporting

enforcement—at least with respect to its preventive function (Berger 2010)—and could have implications for the cost-benefit assessment of enforcement regimes.

I examine potential corporate governance consequences of financial reporting enforcement in the German setting. Introduced in 2004 for all firms listed at an EU-regulated market in Germany, the German financial reporting enforcement regime is characterized by high standards (Brown, Preiato, and Tarca 2014) and considerable rates of error findings (13% of examinations led to error detections in 2014 according to FREP 2015). Virtually all error detections result in mandated error announcements to be disclosed by the deviant firms. The German enforcement regime is purely based on a name-and-shame mechanism without any further legal consequences arising from error announcements. Furthermore, firms have a high likelihood of being repeatedly and randomly chosen for examination (every four to ten years depending on stock market index membership). This is in contrast to the U.S. setting, where the investigations of the Securities and Exchange Commission (SEC) are not based on a sampling mechanism. Over and above, for cost reasons the SEC focuses on such cases with a potential high message value to the market (Feroz, Park, and Pastena 1991). Thus, Accounting and Auditing Enforcement Releases resulting from SEC investigations are potentially biased towards extreme cases of erroneous reporting. Consequently, the German enforcement regime with a more balanced population of examined firms better enables empirical inference. Finally, certain aspects of internal and external accounting oversight are observable in the German setting but not in the U.S. For example, German firms have discretion whether to establish an audit committee and auditor's opinions are usually signed in person by the responsible partner and manager of the audit firm.

My analysis proceeds in two steps. First, I provide descriptive evidence on the German financial reporting enforcement regime and document that non-governance firm characteristics explain the likelihood of being a firm with erroneous financial reporting to a limited ex-

tent only. Second, I examine corporate governance characteristics of 83 error cases and 83 matched control cases in error and post years using a difference-in-differences approach. Error cases are constructed at the firm-year level. An error year is the fiscal year of financial statements and/or management reports detected with errors by the enforcement bodies. A post year is the first full fiscal year after the publication of the first error announcement relating to an error case. On average, the post year is the third fiscal year after the error year. I find that error firms seem to be different from control firms in the error year with respect to both the auditor-client relationship and the structure of the supervisory board[12] in the error year. They are less likely to be audited by a big-four audit firm and to have an unqualified auditor's opinion and are subject to a more time-consuming auditing process. Furthermore, supervisory boards of error firms have fewer committees, fewer members, and are less likely to have an audit committee. In the post year, differences to control firms are insignificant with respect to the structure of the supervisory board, and error firms are more likely to have changed their auditor. However, error firms are still less likely to be audited by a big-four audit firm and they are more likely to receive an auditor's opinion with supplementary notes compared to control firms in the post year.

This paper contributes to three streams of literature. First, I add to the literature on potential determinants of erroneous financial reporting detected by enforcement activities. Only few papers have focused on this issue so far (e.g., Beasley 1996; Dechow, Sloan, and Sweeney 1996; Peasnell, Pope, and Young 2001; Farber 2005) and produced ambiguous results, especially with respect to the role of audit committees. Furthermore, as outlined above, the German setting provides several advantages over the U.S. setting which is used in most of these studies. Second, I add to the literature on potential corporate governance consequences of financial reporting enforcement. While several papers examine corporate governance con-

[12] Joint-stock companies in Germany are required to have a two-tiered board system—a supervisory board exercising corporate control over a separate management board responsible for daily operations (Fohlin 2007).

sequences of restatements, Farber (2005) is to my knowledge the only comprehensive study on corporate governance consequences of enforcement actions. Again, the mentioned advantages of the German setting exist over the U.S. setting which Farber (2005) examines. Furthermore, while he focuses on fraud cases exclusively, my sample includes a broad variety of error types. Thus, my results tend to be more generalizable (Farber 2005: 560). Third, I add to the literature on potential determinants and consequences of errors detected by the German enforcement regime. While prior studies examine various firm characteristics (e.g., Hitz, Ernstberger, and Stich 2012; Strohmenger 2014; Böcking, Gros, and Worret 2015) or auditor dismissals (e.g., Brocard, Franke, and Voeller 2015; Ebner, Hottmann, and Zülch 2015) of error firms, I am the first to my knowledge to present a comprehensive study of corporate governance characteristics in the German enforcement setting.

The remainder of this paper is organized as follows. Section 2 summarizes the related literature and explains the German financial reporting regime. Section 3 presents the research design and describes the empirical results. Section 4 concludes.

2 Background

2.1 Erroneous financial reporting and corporate governance

There is evidence that corporate governance plays a role for earnings quality. Leuz, Nanda, and Wysocki (2003) examine systematic cross-country differences in the level of earnings management and its relations to country-level institutional characteristics. They find earnings management of firms to be negatively associated with investor protection, that is, the extent of minority shareholder rights and the enforcement of these rights. Klein (2002) studies potential relations between board of directors and audit committee characteristics on the one hand and earnings management on the other hand in the U.S. Her results suggest that reductions in the independence of boards of directors or audit committees from the management are followed

by substantial increases in abnormal accruals. She concludes that more independent boards of directors have a better ability to monitor the accounting process effectively. Vafeas (2005) studies board and audit committee structures in the U.S. between 1994 and 2000. He finds that insider-dominated audit committees are associated with lower earnings quality. In contrast, audit committees which meet more often and which have more experienced board members are associated with better earnings quality.

More specifically, prior literature suggests that the likelihood of erroneous financial reporting might be influenced by corporate governance attributes of the respective firms. Beasley (1996) finds the likelihood of fraudulent reporting in the U.S. to be negatively associated with the proportion of outside members in the board of directors. However, he is not able to find an association with the presence of an audit committee. Dechow et al. (1996) conclude that earnings manipulation is motivated by external financing needs. Studying firms which are subject to SEC enforcement actions, they find that these firms have a lower corporate governance quality (e.g., board of directors dominated by the management, no audit committee). Peasnell et al. (2001) study firms in the United Kingdom which have been subject to enforcement actions. They find these firms to have a lower performance in the error year and to be less likely audited by a big-five audit firm in the error year compared to a control sample. Some results suggest that error firms are less likely to have an audit committee, as well.

Farber (2005) contributes to potential determinants of erroneous financial reporting as to potential subsequent changes in corporate governance. He examines firms which have been identified by the SEC as having fraudulently manipulated their financial statements. Fraud firms tend to have lower corporate governance quality (e.g., fewer audit committee meetings, fewer audits by big-four audit firms) compared to control firms in the year prior to fraud detection. However, three years after fraud detection these firms have improved their corporate

governance quality and—with respect to the number of audit committee meetings—even surpass control firms.

There is further evidence in the literature that error firms have incentives to improve their corporate governance after errors are exposed—whether by restatements or by error announcements after enforcement actions. Wiedman and Hendricks (2013) conclude that firms invest in signaling improved reporting quality after restatements. The authors measure better accrual quality for such firms afterwards regardless of whether restatements were earnings-related or not. This effect is more pronounced for firms which were subject to a concurrent CEO change. In general, the structures of boards of directors tend to change following extraordinary events for a firm (Hermalin and Weisbach 2003). Srinivasan (2005) reports significant labor market penalties for outside board members subsequent to restatements. These directors exhibit a greater turnover rate in the three years after a restatement. This effect is especially pronounced for audit committee members and increases in error severity. Johnstone, Li, and Rupley (2011) study corporate governance changes after the mandatory disclosure of internal control material weaknesses. Such firms exhibit a greater turnover rate of board of directors, audit committee, and top management members. Furthermore, respective disclosures are followed by structural changes in the composition of the board of directors and the audit committee. Chakravarthy, deHaan, and Rajgopal (2014) examine firm actions which might be intended to regain reputation after restatements. They find a significant increase in the number of such actions targeting capital providers (e.g., improving board composition, management turnover, changes in internal control systems) and other stakeholder groups.

Further research suggests that detection of erroneous financial reporting has consequences for auditors, as well. Mande and Son (2013) expect firms after restatements to dismiss their auditors in order to increase audit quality and to regain reputation. Their results show an increased likelihood of auditor changes after restatements. This effect is more pronounced when

error severity is high and when the respective firm has had a high level of corporate governance, already. Hennes, Leone, and Miller (2014) study auditor turnover after restatements, as well. They find that the restatement severity is positively associated with the likelihood of auditor dismissals and that this effect is driven by dismissals of non-big-four audit firms. Further results suggest that firms with higher auditor replacement costs and with fewer auditor alternatives are less likely to switch their audit firm.

2.2 Financial reporting enforcement in Germany

Institutional setting

Berger (2010) summarizes the development of and differences between financial reporting enforcement regimes in the European Union (EU). In preparation for the introduction of mandatory IFRS for financial reporting on the consolidated level of firms listed at EU-regulated markets in 2005, the EU Transparency Directive of 2004 required member states to ensure the adherence to accounting standards by the implementation of respective enforcement regimes. Within the boundaries of EU legislation, member states had discretion in shaping their national enforcement regimes. The EU securities authority—back then CESR, nowadays called ESMA—provided guidance to and coordination of member states with respect to enforcement. Germany, which had had no financial reporting enforcement regime before, passed the respective national legislation in December 2004. It set up a two-tiered enforcement regime with a private body—the Financial Reporting Enforcement Panel (FREP)—at the first tier and the public financial markets regulator—the Federal Financial Supervisory Authority (BaFin)—at the second tier.

The German financial reporting enforcement regime is supposed to affect the economy across three dimensions: (1) the revelation of erroneous financial reporting, (2) the preventive improvement of accounting quality, and (3) consequently an increase in the trust into capital

markets.[13] Primarily, financial reporting enforcement examinations in Germany are exercised by the FREP, a non-governmental membership corporation registered in Berlin. Membership is open to associations of preparers and users of financial reporting. The FREP is recognized by the German Federal Government as the first tier of the German financial reporting enforcement regime. However, no firm selected for examination is obliged to cooperate with the FREP nor does the FREP have the ability to exercise public authority. If a firm chooses not to cooperate with the FREP, or if a firm does not accept its investigation results, the FREP refers the case to the BaFin—as the second tier of the enforcement regime and public authority—for re-assessment. Furthermore, all examinations completed by the FREP have to be submitted to the BaFin, which in turn will usually order the respective firm to publish an immediate error announcement, given that material errors had been detected by the FREP. Thus, the FREP could be characterized as possessing quasi-authority arising from the oversight by the BaFin.

Subject to the enforcement regime are all firms with equity or debt instruments listed at the EU-regulated market of an exchange in Germany. This includes foreign firms with such a listing in Germany, as well. Firms are selected for examination based on (1) specific indications of errors received by the FREP, (2) a request by the BaFin, or (3) a risk adjusted-sampling mechanism. The latter tends to be the most prominent reason for examinations. Firms listed in the top indices of Frankfurt Stock Exchange (DAX, MDAX, TecDax, SDAX) are supposed to be selected every four to five years for examination, while all other firms are supposed to be selected every eight to ten years. When a firm is selected for an enforcement procedure, the last prepared consolidated and individual annual financial statements, consolidated and individual annual management reports, and the last published interim report are examined. The FREP evaluates whether the reporting is in line with the relevant GAAP (usually IFRS) and the legislation on financial reporting. However, the enforcement procedure is

[13] The following summary of the institutional details of the German financial reporting enforcement regime is based on Förschle, Grottel, Schmidt, Schubert, and Winkeljohann (2014: § 342b).

not supposed to have the extent of a second audit. For each year, the FREP decides on certain core areas of examination, which will be made available to the public in advance.

Besides the mandatory publication of an error announcement, error detection has no further legal consequences for the respective firm—at least with respect to the consolidated financial reporting. Restatements are only necessary when stipulated by the corresponding GAAP regulations (IAS 8 *Accounting Policies, Changes in Accounting Estimates and Errors* for IFRS). Thus, the German financial reporting enforcement regime relies purely on a name-and-shame mechanism. A detailed flow chart of the enforcement procedure is provided by Böcking et al. (2015: 439).

In 2014, the FREP completed 104 examinations of which 99 were sampling examinations. 13% of examinations led to error detections. Errors were attributable either to the accounting for complex transactions or to insufficient reporting in the notes or in the management report. In 77% of the examinations with error detection the respective firm accepted the judgement of the DPR. The remaining examinations were referred to the BaFin for reassessment (FREP 2015).

Berger (2010) concludes that listed firms in Germany are subject to close control by the enforcement bodies. In line with that, Germany's scoring in the financial reporting enforcement activity index of Brown et al. (2014) improved from five points in 2002 to 19 points in 2005 and 21 points in 2008. In the latter year, this surpasses France (16 points) and is almost on a par with the United Kingdom (22 points). The maximum of 24 points was reached in 2008, for example, by the U.S.

Empirical literature

Ernstberger, Stich, and Vogler (2012) study overall capital market effects potentially related to the German enforcement regime. Their balanced sample of firms listed in Frankfurt between 2003 and 2006 consists of firm-years before and after the introduction of the en-

forcement regime. However, after the introduction some firms—more specifically those not listed at the EU-regulated market but at the exchange-regulated market—remain outside of the enforcement regime and serve as a control group. Firm-years subject to the enforcement regime show significantly less earnings management, higher stock liquidity, and greater market capitalization compared to the pre-introduction and the exchange-regulated firm-years. There is some evidence that these effects might partly be more pronounced for firms which have no cross-listing in the U.S.

Hitz at al. (2012) provide evidence on capital market consequences after error announcements for a sample of cases up to 2009. Conducting an event study they document negative abnormal returns, reductions in daily trading volumes and increasing bid-ask spreads subsequent to the publication of error announcements. The authors conclude that the error announcements represent new, negative information for market participants. A regression analysis suggests that the magnitude of negative abnormal returns might be associated with the severity of errors. Furthermore, the authors construct a principal component for corporate governance quality based on non-compliance with German Corporate Governance Code rules, the importance of variable management compensation, and the extent of earnings management. For their sample, corporate governance quality is significantly negatively correlated with the severity of errors.

Strohmenger (2014) examines characteristics of 85 error cases concerning fiscal years from 2004 to 2009 using a matched sample. He finds that error firms have a significantly lower return on total assets and a significantly lower equity ratio compared to control firms in the year of erroneous reporting on average. Furthermore, multivariate models based on several metrics suggest that error firms exhibit lower earnings quality. Böcking et al. (2015) compare earnings management proxies of error firms with those of firms that have been examined by the enforcement bodies without any error detection. They are able to identify the latter

group of firms by using internal BaFin data. The authors document that (1) error firms manage earnings to a larger extent in the error year compared to non-error firms and (2) error firms show more pronounced earnings management across time in general compared to firms for which errors have never been detected.

Brocard et al. (2015) find that that error firms are more likely to change their auditor in general and to switch from a non-big-four to a big-four audit in particular. In contrast, Ebner at al. (2015) find no significantly different turnover rates for auditors of error firms in the first or second year after the publication of an error announcement compared to a control group. Häfele and Riediger (2015) investigate potential contagion effects of error announcements. They provide evidence that industry peers of error firms (1) suffer from negative abnormal returns after the respective error announcements and (2) increase the timeliness of their loss recognition afterwards.

Altogether, the hitherto existing literature suggests that error firms in Germany have a lower performance and greater leverage and show larger amounts of earnings management compared to control firms. Lower corporate governance quality might be associated with more severe errors. The publication of error announcements seems to provide new, negative information to market participants.

3 Empirical analysis

3.1 Data and base sample

Enforcement regime data

All firms with equity or debt instruments listed at the EU-regulated market of a German exchange are subject to the German financial reporting enforcement regime. Based on data BaFin data, I derive the number of firms subject to the enforcement regime by year. A firm is classified as being subject to the enforcement regime in a specific year when its annual report

for this year could be examined by the enforcement bodies. Between 2004 and 2013, the number of firms subject to the enforcement regime fell from 1,234 to 756 (–39%). In each year, the majority of these firms has its primary equity instrument listed at a German stock exchange according to Datastream and Worldscope data. This implies that the respective firms are subject to the enforcement regime because either (1) the equity instrument is listed at an EU-regulated market or (2) the equity instrument is listed at an exchange-regulated market but the firm has a debt instrument listed at an EU-regulated market at the same time. Hence, the remaining firms are subject to the enforcement regime because either (1) they have equity instruments listed at an EU-regulated market in Germany which are cross-listings only or (2) they have debt instruments but no equity instruments listed at an EU-regulated market in Germany.

Error case data

As a result of the activities of the enforcement bodies, firms had to publish 210 error announcements in the electronic Federal Gazette until the end of 2014. The first error announcement was published on February 3, 2006. The last error announcement considered in this study was published on November 15, 2014. The errors of a specific firm-year are sometimes split into multiple error announcements, and sometimes error announcements are amended by subsequent error announcements. Therefore, I construct 186 error cases from the 210 error announcements. Error cases can comprise one or several errors in the consolidated and individual annual financial statements and in the consolidated and individual annual management reports. They are constructed on the firm-year level with respect to the year of the erroneous reports. The yearly share of error cases relative to all firms subject to the enforcement regime ranges from 1.1% to 2.9% between 2004 and 2012. No error announcements relating to the reporting of 2013 had been published by the end of 2014, and further error announcements concerning the reporting before 2013 might be published after 2014. The aver-

age duration of the enforcement procedure, i.e. the time between the fiscal-year end of an error case and the publication of the first related error announcement, declined from 2.7 years with respect to the 2004 error cases to 1.3 years with respect to the 2012 error cases. The numbers of firms subject to the enforcement regime and of error cases by year are presented in Figure 1, Figure 2, and Table 1.

[Figure 1 about here]

[Figure 2 about here]

[Table 1 about here]

Table 2 summarizes basic features of the 186 error cases. 85% involve errors in the consolidated reporting, and 96% involve errors in the consolidated or individual financial statements. 8% are cases of recurrence, i.e. they are not the first error cases for a specific firm. The average duration of the enforcement procedure across all error cases is 1.8 years. While most cases were completed by the FREP at the first tier of the enforcement regime, 21% were referred to BaFin for re-assessment.

[Table 2 about here]

Sample development

This study focuses on firms with primary equity listings at stock exchanges in Germany. The Datastream universe provides 12,179 respective firm-years for the years 2004 to 2012. The latter is the last year for which error cases had become public by the end of 2014. Subject to the enforcement regime are 6,069 firm-years. I exclude observations which are of foreign firms, not reported in EUR, not following IFRS, or have incomplete fiscal years. Finally, observations with required Worldscope financial statements data missing and with equity or sales equal to or less than zero are deleted. This yields a base sample of 4,017 firm-years. Thereof 128 are error cases. Table 3 summarizes the sample development.

[Table 3 about here]

3.2 Potential non-governance determinants of error cases

Variable distribution and correlations

Table 4 presents the distribution of firm-years in the base sample by year and by industry based on SIC divisions. The most represented industry is manufacturing (44%), followed by services (23%) and finance, insurance, and real estate (17%).

[Table 4 about here]

Summary statistics of general firm characteristics are presented in Table 5. All non-dummy variables are winsorized at the 1% and 99% level. About 3% of the firm-years in the base sample are error cases *(ERROR_CASE)* and 95% are listed with their primary equity instrument at Frankfurt Stock Exchange or on XETRA *(FRANKFURT).* The latter is in line with the dominance of the Frankfurt Stock Exchange compared to the other so-called "regional" stock exchanges in Germany. For details on the structure of the German stock market see Stehle and Schmidt (2015). On average, firm-years have total assets of 7.3 billion EUR *(TA),* total shareholder's equity of 1.1 billion EUR *(EQUITY),* and a market capitalization of 1.8 billion EUR *(MKTCAP).*

[Table 5 about here]

Table 6 presents Pearson and Spearman correlations of general firm characteristics for the base sample. The *ERROR_CASE* dummy is—at the 10% level—significantly positively correlated with a listing at the Frankfurt Stock Exchange or on XETRA and significantly negatively correlated with earnings before interest and taxes *(EBIT)* and the return on total assets *(ROA)*. However, the correlations are rather small.

[Table 6 about here]

Logit regression analysis

Before examining corporate governance differences between error cases control cases, I provide an analysis of potential non-governance determinants of error cases in order to get a

better understanding of the empirical setting. Table 7 summarizes the results. The *ERROR_CASE* dummy is regressed on selected general firm characteristics using a logit regression. Firm size is measured by the natural logarithm of total assets *(TA_LN)*. The equity ratio represents the leverage *(EQ_RATIO)*. The market-to-book ratio is a common proxy for expected firm growth and for firm risk *(MTB)*. Profitability is measured by the return on total assets *(ROA)*. Furthermore, the dummy for a primary equity listing at Frankfurt Stock Exchange or on XETRA is included *(FRANKFURT)* as are year-fixed effects and industry-fixed effects based on SIC divisions. Firm size is significantly negatively associated with error cases while a listing in Frankfurt is significantly positively associated with error cases. The latter could be due to the fact that firms in the major indices of Frankfurt Stock Exchange have a higher likelihood to be selected for examination by the enforcement bodies. With respect to the fixed effects, the year 2005 increases the likelihood for error cases significantly at the 1% level. 2005 was the first year of mandatory IFRS reporting at the consolidated level by firms listed at an EU-regulated equity market. Thus, the significant dummy variable for 2005 might hint at IFRS adoption problems.

However, the results of the logit regression might be biased by firms from the finance, insurance, and real estate industry which tend to have a distinctively different balance sheet structure compared to other firms. Therefore, I re-estimate the logit regression after excluding firms from the respective industry from the base sample. The 2005 dummy stays significant (at the 5% level), but *FRANKFURT* and *TA_LN* lose significance. Instead, the equity ratio shows a significantly negative association with error cases. Of the 96 error cases in the respective sample, only one is not listed in Frankfurt. Therefore, I re-estimate the latter logit regression for firms listed in Frankfurt only and obtain similar results. As a last robustness check, I replace *TA_LN* with the natural logarithm of net sales *(SALES_LN)* as an alternative proxy for firm size, and obtain similar results again. The regression results indicate that firms

with a smaller equity ratio and observations from 2005—the first year of mandatory IFRS reporting—have a higher likelihood to be an error case. However, the independent variables employed are just to a limited extend able to explain the error cases: the Nagelkerke R^2 ranges from 2.8% to 3.4% depending on the regression model. The finding for the equity ratio is in line with Strohmenger (2014). In contrast to him, I am not able to document a significant association between error cases and lower returns on total assets. Furthermore, the documented negative association between the equity ratio and error cases is supported by Dechow et al. (1996) who suggest for the U.S. that firms with greater external financing needs are more likely to manipulate earnings.

[Table 7 about here]

3.3 Difference-in-differences analysis of corporate governance

Matching procedure

In the following, I examine potential corporate governance differences between error and control cases and whether error detection is associated with subsequent changes in corporate governance. Therefore, I apply a matching procedure in order to assign one control case to each error case. The intention is to match firms which are likely to have similar corporate governance based on their general firm structure in the error year. It should be noted that it is not of my interest to match firms with a similar likelihood of being error cases. Matching is done starting from the base sample developed above, from which I exclude all potential control cases of firms which have prior or subsequent error cases, and error cases of same firms for which the enforcement procedures overlap. Following Farber (2005), control cases have to be within ±25% of net sales of an error case and from the same industry. Furthermore, their primary equity instruments have to be listed at the same stock exchange and their fiscal-year ends have to be equal. Pair-wise matching is done without replacement and priority is given to those error cases with the smallest amount of potential matches. Industry is matched based on

the most detailed SIC code possible. 12% of the pairs are matched on four-digit SIC codes, 17% on three-digit SIC codes, 24% on two-digit SIC codes, and 47% on SIC divisions. Finally, if possible, the distance in net sales is minimized.

Given these requirements, 84 of 111 error cases could be matched if replacement would be applied. Without replacement, I obtain 83 matched pairs. Table 8 summarizes the matching procedure. Table 9 provides a comparison of general firm characteristics of the matched pairs in the error years. However, the differences are insignificant for all variables examined. Thus, the matched pairs are expected to have a similar corporate governance based on their general firm structure.

[Table 8 about here]

[Table 9 about here]

Corporate governance data and variables

Data on corporate governance is hand collected for error and control cases from the (consolidated, if applicable) annual reports of the error year and of the post year. A post year is defined as the first full fiscal year after the publication of the first error announcement related to an error case. This definition is supposed to ensure that the enforcement procedure has been completed by the beginning of the post year. Therefore, the corporate governance characteristics of the post year are expected to be uninfluenced by an ongoing enforcement procedure. The post year is the second fiscal year after the error year in 11% of the cases, the third fiscal year in 64% of the cases, the fourth fiscal year in 22% of the cases, and the fifth or sixth fiscal year in 4% of the cases. The matched sample consists of 332 firm-years. However, sample size varies across variables because of missing data. This is primarily due to (1) firms organized in a non-German legal form, (2) annual reports not yet or not anymore being available on a firm's website or in the electronic Federal Gazette, (3) post-year observations having incomplete fiscal years, (4) post-year reporting in local GAAP, (5) non-disclosure of items in

annual reports, and (6) incomplete Worldscope data on total assets. Furthermore, enforcement regime status information is not available for 2014 and 2015 yet.

Table 10 presents summary statistics of the collected corporate governance characteristics for the matched pairs across error and post years. All non-dummy variable are winsorized at the 1% and 99% level. *ENF_REGIME* and *EQ_LISTING* indicate whether a firm-year is subject to the enforcement regime and whether a fiscal-year end market price for the primary equity instrument of a firm is available on Worldscope, respectively. The remaining variables concern either the auditor-firm relationship or the structure of the supervisory board. An auditor's opinion has to be signed in Germany by the auditor in person.[14] For a larger audit firm, usually two auditors—the responsible partner and manager—sign. *AUD_TEAM_ROTATE* indicates whether all signing auditors in the post year are different from the signing auditors in the error year. Such a complete change of the audit team can be either due to internal rotation or a switch to another audit firm. The latter is specifically indicated by *AUD_FIRM_ROTATE*, which is conceptually a subset of *AUD_TEAM_ROTATE*. Firm-years audited by one of the internationally dominant audit firms Deloitte, EY, KPMG, or PWC are indicated with *BIG4*. Prior literature suggests that large audit firms are more independent from its clients and thus provide higher audit quality (DeAngelo 1981). Since the German audit market is actually characterized by five dominant audit firms, I use *BIG5* as an additional dummy incorporating BDO, as well (Ashbaugh and Warfield 2003).

AUD_UNQUAL indicates an unqualified auditor's opinions. Additional to the type of the auditor's opinion, a German auditor has the opportunity or the duty to supplement a—unqualified or qualified—auditor's opinion with notes on specific issues.[15] First, an auditor can provide supplementary notes on any issue he deems relevant (usually uncertain issues arising from the financial reporting). Second, an auditor has to provide supplementary notes if

[14] Förschle et al. (2014: § 322, note 155).
[15] Förschle et al. (2014: § 322, notes 36–39).

the survival of the firm is uncertain to a significant extant (even if the circumstances do not require a qualification of the auditor's opinion). *AO_SUPPL* indicates that the auditor's opinion contains such supplementary notes. *AUD_TIME* is the period in days between the fiscal-year end and the date of the auditor's opinion. This so-called audit delay can be interpreted as a proxy for time and resources spent on an audit (Ashton, Willingham, and Elliott 1987). The fees charged by the auditor for auditing the annual financial statements and the management report have to be disclosed in the notes to the financial statements. Audit fees are supposed to reflect the audit effort on the one hand and expected losses from the auditing on the other hand (Simunic 1980). *AUD_FEE_TA* are the audit fees scaled by the average total assets of a fiscal year. Non-audit-services charged by the same auditor have to be disclosed, as well. They can comprise audit-related services, tax advisory, and other services.[16] *NAS_AUD_RATIO* are the fees for non-audit services charged by the auditor divided by the audit fees. It might be the case that the importance of non-audit service fees within an auditor-client relationship is negatively associated with audit quality, although empirical results are mixed (DeFond, Raghunandan, and Subramanyam 2002). *TOT_FEE_TA* is the sum of audit and non-audit services fees scaled by the average total assets of a fiscal year.

Information on the structure of the supervisory board is obtained from the mandatory report of the supervisory board, the remuneration report within the management report, and the notes to the financial statements. *BOARD_MEET* is the number of ordinary and extraordinary meetings of the supervisory board in a fiscal year including conference calls. *COMMITTEES* is the number of committees of the supervisory board. Audit committees are not mandatory for joint-stock companies in Germany.[17] Thus, *AUDIT_COMM* indicates whether the supervisory board has voluntarily established an audit committee. *BOARD_MEMB* is the number of members of the supervisory board. *COMP_MEMB_TA* is the average yearly compensation of

[16] Förschle et al. (2014: § 314, notes 90–94).
[17] Förschle et al. (2014: § 324, note 3).

a supervisory board member scaled by the average total assets of the fiscal year. There is some evidence that performance-based management compensation reduces earnings quality (Bergstresser and Philippon 2006). Likewise, a performance-based compensation of supervisory board members might decrease their incentives to fulfill their oversight role over the accounting process sufficiently. *VAR_COMP* indicates whether the compensation of the supervisory board has variable components, regardless of whether the respective criteria (e.g., firm performance, dividend payments) are met in the respective fiscal year.

[Table 10 about here]

Difference-in-differences analysis with unbalanced sample

This difference-in-differences analysis of corporate governance characteristics is conducted based on the unbalanced matched sample developed above. Thus, it contains matched pairs with missing data in order to utilize a larger sample size. A second difference-in-differences analysis based on a balanced matched sample is conducted later on as a robustness check. The results for the unbalanced sample are presented in Table 11. In the following, I summarize primarily statistically significant differences and developments.

[Table 11 about here]

In the post year, 17% of error cases and 20% of controls cases are not subject to the enforcement regime, anymore, and 7% of both error and control cases have delisted with their primary equity instrument from the stock exchange. However, there is no significantly different development between error and control cases. 42% of error cases have switched their auditor by the post year which are significantly more than for the control cases (24%). This result contrasts with Ebner et al. (2015) who do not find a significantly different turnover rate for error firms but confirms Brocard et al. (2015). In terms of having a big-four audit firm, error cases seem to be systematically different from control cases. In both error and post years they have a significantly lesser likelihood of being audited by a big-four firm. This is in line

with results by Farber (2005) for the U.S. and with correlations by Böcking et al. (2015) for the German setting on the one hand but contrasts with Brocard et al. (2015) for the post year on the other hand. However, there is no significant difference when big-five audit firms are examined. In the error year, significantly less error cases have unqualified auditor's opinions compared to the control cases. 93% of the error cases have unqualified auditor's opinions, while all auditor's opinions of the control cases are unqualified. Gassen and Skaife (2009) find for the whole German market 98% of auditor's opinions to be unqualified in 1999/2000. My finding can be interpreted in two different ways. First, error cases might be in a worse financial condition in the error year compared to the control cases and therefore are more likely to receive a qualified auditor's opinion. However, the comparison of general firm characteristics presented in Table 9 does not support such an interpretation. Second, auditors might have detected at least some of the errors which will result in error announcements later on and have decided to qualify their auditor's opinion due to these errors. This would imply that not all error cases should be considered as audit failures. Furthermore, it is noteworthy that it might be possible that a qualified auditor's opinion actually triggered a subsequent enforcement procedure.

In the post year, the difference in the shares of unqualified auditor's opinions is insignificant. However, error cases have a significantly greater probability to receive an unqualified or qualified auditor's opinion with supplementary notes in the post year compared to the control cases (19% vs. 3%). This implies that either (1) financial reporting issues or the survival of the firm itself are more uncertain for error cases in post years compared to the control cases, or (2) that auditors are more prudent in the assessment of error cases in post years compared to the control cases. The time period between the fiscal-year end and the date of the respective auditor's opinion is significantly longer for error cases compared to the control cases in both error and post years (average difference of 17 days in error years and 16 days in post years).

Presumably, either the auditing process itself or the negotiations between auditor and firm about controversial issues are more complex for error cases across periods. Again, this might hint at error cases being systematically different from control cases in this respect. The finding on audit time is generally in line with findings by Hitz, Löw, and Solka (2013) for the German setting. However, while they find an average audit time of 72 days across all observations, the average audit time across my matched sample amounts to 85 days. With respect to audit fees and total fees charged by the auditor, average scaled values are greater for error cases. However, the differences are insignificant.

Examining the structure of the supervisory board, error cases have in the error year significantly fewer committees, a lower probability to have an audit committee, and fewer supervisory board members compared to control firms. The lower frequency of audit committees is in line with results by Dechow et al. (1996) for the U.S. setting. All these differences are insignificant in the post year. This might hint at a potential improvement of the structure of the supervisory board resulting from the enforcement procedure and, in turn, an alignment with control cases in the post year. Furthermore, the average scaled compensation of supervisory board members has increased for error cases significantly by the post year. However, the differences to the control cases are insignificant in both error and post years.

Robustness check: difference-in-differences analysis with balanced sample

In order to obtain a balanced sample, all matched pairs which have any missing corporate governance variable in the error or post year are deleted. This results in 31 matched pairs or 124 firm-year observations. Many of the differences and developments summarized above turn insignificant when the balanced matched sample is used for the difference-in-differences analysis of corporate governance characteristics. However, the directions are similar. The following findings from above remain significant: (1) error cases are less likely to be audited by a big-four firm in the error year compared to the control cases, (2) error cases are more

likely to receive an auditor's opinion with supplementary notes in the post year compared to the control cases, and (3) the average scaled compensation of supervisory board members has increased by the post year for error cases. The results of the robustness check are presented in Table 12.

[Table 12 about here]

4 Conclusion

This paper sheds light on characteristics of firms detected with financial reporting errors under the German financial reporting enforcement regime with a special emphasis on corporate governance. Furthermore, it examines whether corporate governance characteristics have changed after the publication of detected errors using a matched-sample approach. First, I document that several non-governance characteristics are only weakly associated with the likelihood to become an error firm. Second, error firms seem to be different from control firms with respect to corporate governance. Examining the auditor-client relationship in the error year, firms with erroneous financial reporting are less likely to be audited by a big-four audit firm and have more often a qualified auditor's opinion. The average duration of an audit is longer than for the control firms. Turning to the structure of the supervisory board, error firms have fewer committees and members of the supervisory board in the error year. Furthermore, they are less likely to have an audit committee. Third, an analysis of error firms in the first full fiscal year after the first respective error announcement suggests that there might be improvements in their corporate governance. The differences in the structure of the supervisory board have turned insignificant compared to control firms and the compensation of supervisory board members has increased. In contrast, the lower likelihood of being audited by a big-four auditor and the greater duration of audits remain. However, error firms exhibit more auditor changes, and are more likely to receive auditor's opinions with supplementary notes after the error announcement.

My findings have three potential implications for the understanding of the determinants of erroneous financial reporting and of the mechanisms of financial reporting enforcement. First, erroneous financial reporting seems to be associated with corporate governance characteristics of error firms. Second, while several corporate governance characteristics of error firms seem to improve after enforcement actions, some differences relative to control firms continue to exist with respect to the auditor-client relationship. Third, the German financial reporting enforcement regime might be able contribute to the prevention of potential future errors by triggering corporate governance improvements. However, further research is necessary in this regard. Finally, I emphasize that my results must be interpreted with caution, especially due to the small number of matched firm pairs under examination.

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Figure 1: Firms subject to enforcement regime by year

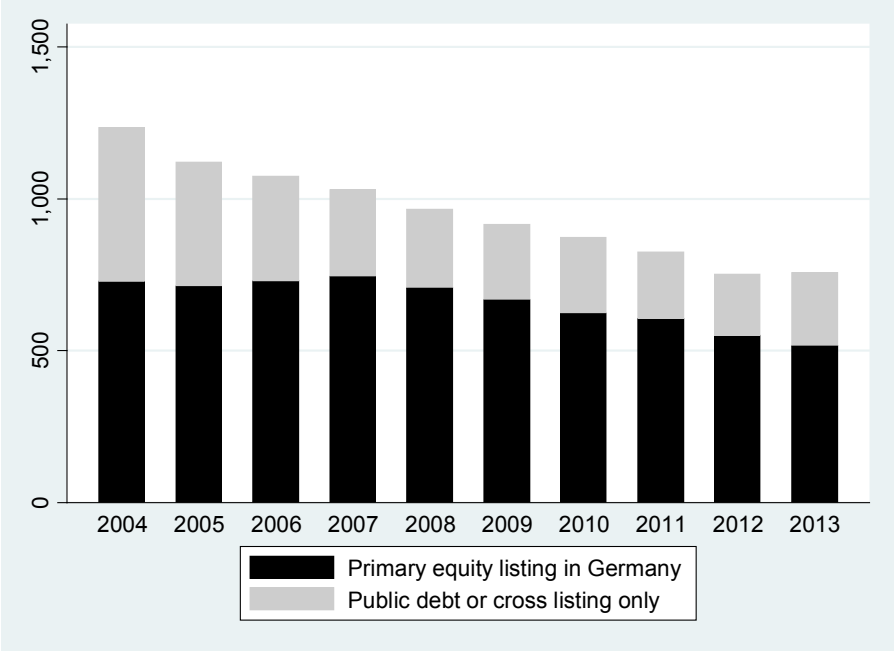
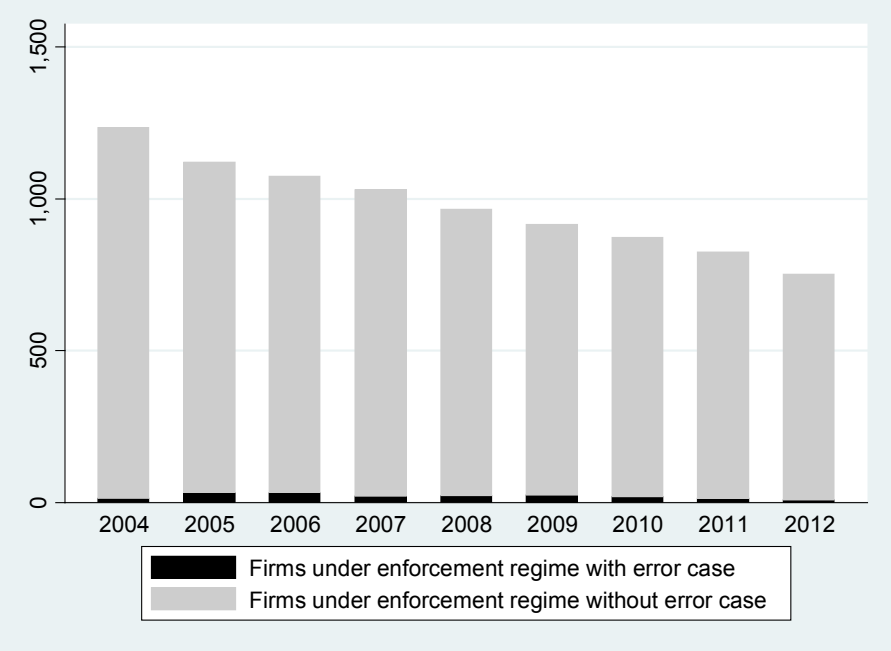


Figure 2: Error cases by year



Error cases are constructed on firm-year level from all error announcements published until the end of 2014. An error case can comprise one or several errors in the consolidated and individual annual financial statements and in the consolidated and individual annual management reports.

Table 1: Firms subject to enforcement regime and error cases by year

Year	Firms subject to enforcement regime			Error cases	Duration of enforcement procedure (average years)
	Total	Primary equity listing in Germany	Public debt or cross-listing only		
2004	1,234	728 (59.0%)	506 (41.0%)	13 (1.1%)	2.725
2005	1,120	712 (63.6%)	408 (36.4%)	32 (2.9%)	1.812
2006	1,074	731 (68.1%)	343 (31.9%)	31 (2.9%)	1.945
2007	1,029	745 (72.4%)	284 (27.6%)	21 (2.0%)	1.827
2008	965	707 (73.3%)	258 (26.7%)	22 (2.3%)	1.780
2009	915	667 (72.9%)	248 (27.1%)	24 (2.6%)	1.536
2010	873	624 (71.5%)	249 (28.5%)	20 (2.3%)	1.626
2011	824	605 (73.4%)	219 (26.6%)	14 (1.7%)	1.423
2012	751	550 (73.2%)	201 (26.8%)	9 (1.2%)	1.349
2013	756	517 (68.4%)	239 (31.6%)	—	—
Σ				186	

Error cases are constructed on firm-year level from all error announcements published until the end of 2014. An error case can comprise one or several errors in the consolidated and individual annual financial statements and in the consolidated and individual annual management reports. The duration of the enforcement procedure is the time between the fiscal-year end of an error case and the publication of the first related error announcement. Values in braces represent the share of the total numbers of firms subject to the enforcement regime in the respective fiscal year.

Table 2: Error case characteristics

Characteristics	N	Mean	S.D.	Min	P25	Median	P75	Max
Consolidated reporting concerned only	186	0.608						
Consolidated and individual reporting concerned	186	0.242						
Individual reporting concerned only	186	0.151						
Financial statements concerned only	186	0.790						
Financial statements and management reports concerned	186	0.172						
Management reports concerned only	186	0.038						
Cases of recurrence	186	0.075						
Duration of enforcement procedure (years)	186	1.789	0.702	0.556	1.334	1.642	2.162	4.975
Enforcement procedure completed by BaFin (second tier, public)	186	0.210						

Error cases are constructed on firm-year level from all error announcements published until the end of 2014. An error case can comprise one or several errors in the consolidated and individual annual financial statements and in the consolidated and individual annual management reports. The duration of the enforcement procedure is the time between the fiscal-year end of an error case and the publication of the first related error announcement.

Table 3: Sample development

	Total	Thereof: error cases
Datastream firm-years with primary equity listing in Germany (2004–2012)	12,179	167
Not subject to enforcement regime	–6,110	—
Foreign firms	–265	–10
Reporting not in EUR	–620	–2
Reporting not following IFRS	–906	–12
Incomplete fiscal years	–47	–3
Required Worldscope financial statements data missing	–53	–2
Equity or sales equal to or less than zero	–161	–10
Base sample	4,017	128

Error cases are constructed on firm-year level from all error announcements published until the end of 2014. An error case can comprise one or several errors in the consolidated and individual annual financial statements and in the consolidated and individual annual management reports.

Table 4: Firm-year observations by year and by industry

Year	Total	Thereof: error cases	SIC divisions	Total	Thereof: error cases
2004	236	4	A: Agriculture, forestry, and fishing (01–09)	23	1
2005	466	24	B: Mining (10–14)	26	1
2006	521	21	C: Construction (15–17)	55	2
2007	532	13	D: Manufacturing (20–39)	1,749	45
2008	499	17	E: Transportation, communications, electric, gas, and sanitary services (40–49)	305	11
2009	474	16	F: Wholesale trade (50–51)	110	2
2010	451	14	G: Retail trade (52–59)	136	5
2011	439	12	H: Finance, insurance, and real estate (60–67)	692	32
2012	399	7	I: Services (70–89)	921	29
Σ	4,017	128		4,017	128

Error cases are constructed on firm-year level from all error announcements published until the end of 2014. An error case can comprise one or several errors in the consolidated and individual annual financial statements and in the consolidated and individual annual management reports. Two-digit SIC code ranges of SIC divisions are provided in braces.

Table 5: Summary statistics of general firm characteristics

Variable	N	Mean	S.D.	Min	P25	Median	P75	Max
ERROR_CASE	4,017	0.032						
FRANKFURT	4,017	0.952						
TA	4,017	7,341,690	29,223,594	4,426	52,616	175,534	951,740	205,603,000
EQUITY	4,017	1,113,604	4,071,030	1,343	23,302	73,642	320,637	30,261,000
EQ_RATIO	4,017	0.442	0.229	0.018	0.278	0.416	0.603	0.978
MKTCAP	4,017	1,793,571	5,969,040	3,409	32,356	105,801	566,495	41,704,171
MTB	4,017	2.071	1.865	0.313	0.988	1.514	2.461	11.769
SALES	4,017	3,002,219	10,338,181	1,044	38,946	146,099	792,489	67,956,000
EBIT	4,017	246,515	933,680	–155,793	1,312	9,309	61,700	6,567,000
ROA	4,017	0.053	0.128	–0.502	0.016	0.061	0.109	0.387

ERROR_CASE is a dummy variable for firm-years representing an error case. Error cases are constructed on firm-year level from all error announcements published until the end of 2014. An error case can comprise one or several errors in the consolidated and individual annual financial statements and in the consolidated and individual annual management reports. *FRANKFURT* is a dummy variable for firms with primary equity listing at Frankfurt Stock Exchange or on XETRA. *TA* is total assets in thousand EUR (WC02999). *EQUITY* is total shareholder's equity in thousand EUR (WC03995). *EQ_RATIO* is total shareholder's equity divided by total assets. *MKTCAP* is market capitalization in thousand EUR (WC08001). *MTB* is market capitalization divided by total shareholder's equity. *SALES* is net sales or revenues in thousand EUR (WC01001). *EBIT* is earnings before interest and taxes in thousand EUR (WC18191). *ROA* is earnings before interest and taxes divided by the average of total assets and total assets of the previous fiscal year. All non-dummy variables are winsorized at the 1% and 99% level.

Table 6: Pearson (below) and Spearman (above) correlations of general firm characteristics

	Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1)	*ERROR_CASE*	X	**0.027**	–0.013	–0.024	–0.022	–0.023	0.009	–0.023	**–0.030**	**–0.027**
(2)	*FRANKFURT*	**0.027**	X	**0.094**	**0.102**	0.006	**0.122**	**0.058**	**0.169**	**0.111**	**0.056**
(3)	*TA_LN*	–0.016	**0.105**	X	**0.941**	**–0.458**	**0.887**	0.003	**0.886**	**0.744**	**0.056**
(4)	*EQUITY_LN*	–0.025	**0.111**	**0.942**	X	**–0.187**	**0.923**	**–0.037**	**0.838**	**0.752**	**0.129**
(5)	*EQ_RATIO*	–0.019	0.005	**–0.488**	**–0.217**	X	**–0.207**	**–0.085**	**–0.437**	**–0.237**	**0.243**
(6)	*MKTCAP_LN*	–0.022	**0.126**	**0.899**	**0.938**	**–0.241**	X	**0.310**	**0.817**	**0.773**	**0.231**
(7)	*MTB*	0.020	**0.036**	**–0.088**	**–0.150**	**–0.085**	**0.165**	X	**0.074**	**0.173**	**0.306**
(8)	*SALES_LN*	–0.010	**0.061**	**0.615**	**0.611**	**–0.255**	**0.584**	**–0.057**	X	**0.726**	**0.150**
(9)	*EBIT*	**–0.030**	**0.058**	**0.581**	**0.581**	**–0.220**	**0.562**	**–0.036**	**0.846**	X	**0.537**
(10)	*ROA*	**–0.026**	0.019	**0.108**	**0.178**	**0.115**	**0.229**	**0.082**	0.007	**0.052**	X

N = 4,017. *ERROR_CASE* is a dummy variable for firm-years representing an error case. Error cases are constructed on firm-year level from all error announcements published until the end of 2014. An error case can comprise one or several errors in the consolidated and individual annual financial statements and in the consolidated and individual annual management reports. *FRANKFURT* is a dummy variable for firms with primary equity listing at Frankfurt Stock Exchange or on XETRA. *TA_LN* is the natural logarithm of total assets in thousand EUR (WC02999). *EQUITY_LN* is the natural logarithm of total shareholder's equity in thousand EUR (WC03995). *EQ_RATIO* is total shareholder's equity divided by total assets. *MKTCAP_LN* is the natural logarithm of market capitalization in thousand EUR (WC08001). *MTB* is market capitalization divided by total shareholder's equity. *SALES_LN* is the natural logarithm of net sales or revenues in thousand EUR (WC01001). *EBIT* is earnings before interest and taxes in thousand EUR (WC18191). *ROA* is earnings before interest and taxes divided by the average of total assets and total assets of the previous fiscal year. All non-dummy variables are winsorized at the 1% and 99% level. Bold values indicate significance at the 10% level or lower.

Table 7: Logit regression analysis of potential non-governance determinants of error cases

	ERROR_CASE			
	Base sample	No financials	No financials; Frankfurt only	No financials; Frankfurt only
Intercept	**–3.287 *** (1.035)**	**–3.747 *** (1.320)**	**–1.956 ** (0.949)**	**–2.091 ** (0.970)**
FRANKFURT	**1.448 ** (0.724)**	1.675 (1.019)	—	—
TA_LN	**–0.099 ** (0.050)**	–0.072 (0.061)	–0.076 (0.061)	—
EQ_RATIO	–0.638 (0.460)	**–0.979 * (0.544)**	**–1.087 ** (0.548)**	**–1.093 * (0.562)**
MTB	0.027 (0.044)	0.024 (0.050)	0.021 (0.051)	0.023 (0.050)
SALES_LN	—	—	—	–0.066 (0.061)
ROA	–0.780 (0.664)	–0.922 (0.750)	–0.949 (0.753)	–0.918 (0.777)
Fixed effects	Year Industry	Year Industry	Year Industry	Year Industry
R^2 (Nagelkerke)	0.034	0.030	0.029	0.028
N (*ERROR_CASE* = 1)	128	96	95	95
N	4,017	3,325	3,181	3,181

ERROR_CASE is a dummy variable for firm-years representing an error case. Error cases are constructed on firm-year level from all error announcements published until the end of 2014. An error case can comprise one or several errors in the consolidated and individual annual financial statements and in the consolidated and individual annual management reports. *FRANKFURT* is a dummy variable for firms with primary equity listing at Frankfurt Stock Exchange or on XETRA. *TA_LN* is the natural logarithm of total assets in thousand EUR (WC02999). *EQ_RATIO* is total shareholder's equity (WC03995) divided by total assets. *MTB* is market capitalization (WC08001) divided by total shareholder's equity. *SALES_LN* is the natural logarithm of net sales or revenues in thousand EUR (WC01001). *ROA* is earnings before interest and taxes (WC18191) divided by the average of total assets and total assets of the previous fiscal year. Industry-fixed effects are measured by SIC divisions. All non-dummy variables are winsorized at the 1% and 99% level. "No financials" indicates that firms of SIC division H (finance, insurance, and real estate) are excluded. "Frankfurt only" indicates that only firms with primary equity listing at Frankfurt Stock Exchange or on XETRA are retained. Standard errors for parameter estimates are provided in braces. Estimates for logit regressions are the natural logarithms of the odds ratios. */**/*** marks significance at the 10/5/1% level.

Table 8: Matching procedure

	Error cases	Control cases
Base sample	128	3,889
Control cases of firms with prior or subsequent error cases	—	–704
Error cases of same firm for which enforcement procedures overlap	–17	—
Sample for matching	111	3,185
Potential matched pairs if replacement would be applied	84	73
Matched pairs (without replacement)	83	83

Error cases are constructed on firm-year level from all error announcements published until the end of 2014. An error case can comprise one or several errors in the consolidated and individual annual financial statements and in the consolidated and individual annual management reports. Control cases are firm-years which do not represent error cases in the respective fiscal year.

Table 9: Comparison of general firm characteristics of matched pairs in error years

Variable	Error cases (a)	Control cases (b)	(a) – (b)	
ERROR_CASE	1.000	0.000	**1.000 (0.000)**	***
FRANKFURT	1.000	1.000	0.000 (0.000)	
TA_LN	12.011	12.001	0.010 (0.311)	
EQUITY_LN	10.918	11.112	–0.194 (0.296)	
EQ_RATIO	0.432	0.491	–0.059 (0.037)	
MKTCAP_LN	11.348	11.510	–0.162 (0.309)	
MTB	2.622	1.898	0.724 (0.560)	
SALES_LN	11.594	11.609	–0.015 (0.295)	
EBIT	79,695	74,901	4,794 (57,732)	
ROA	0.035	0.032	0.003 (0.020)	
N	83	83		

N = 166. Error year is the fiscal year of an error case. Error cases are constructed on firm-year level from all error announcements published until the end of 2014. An error case can comprise one or several errors in the consolidated and individual annual financial statements and in the consolidated and individual annual management reports. Control cases are firm-years which do not represent error cases in the respective fiscal year. *ERROR_CASE* is a dummy variable for firm-years representing an error case. Error cases are constructed on firm-year level from all error announcements published until the end of 2014. *FRANKFURT* is a dummy variable for firms with primary equity listing at Frankfurt Stock Exchange or on XETRA. *TA_LN* is the natural logarithm of total assets in thousand EUR (WC02999). *EQUITY_LN* is the natural logarithm of total shareholder's equity in thousand EUR (WC03995). *EQ_RATIO* is total shareholder's equity divided by total assets. *MKTCAP_LN* is the natural logarithm of market capitalization in thousand EUR (WC08001). *MTB* is market capitalization divided by total shareholder's equity. *SALES_LN* is the natural logarithm of net sales or revenues in thousand EUR (WC01001). *EBIT* is earnings before interest and taxes in thousand EUR (WC18191). *ROA* is earnings before interest and taxes divided by the average of total assets and total assets of the previous fiscal year. All non-dummy variables were winsorized at the 1% and 99% level. Standard errors for differences in means are provided in braces. */**/*** marks significance at the 10/5/1% level.

Table 10: Summary statistics of corporate governance of matched pairs in error and post years

Variable	N	Mean	S.D.	Min	P25	Median	P75	Max
ENF_REGIME	306	0.915						
EQ_LISTING	318	0.969						
AUD_TEAM_ROTATE	117	0.487						
AUD_FIRM_ROTATE	118	0.331						
BIG4	279	0.513						
BIG5	279	0.613						
AO_UNQUAL	279	0.968						
AO_SUPPL	279	0.136						
AUDIT_TIME	279	85.025	32.358	35	66	79	98	225
AUD_FEE_TA	269	0.00204	0.00231	0.00004	0.00046	0.00133	0.00256	0.01205
NAS_AUD_RATIO	275	0.548	0.942	0.000	0.060	0.283	0.534	5.735
TOT_FEE_TA	269	0.00276	0.00304	0.00008	0.00067	0.00175	0.00365	0.01578
BOARD_MEET	275	6.302	3.011	3	4	5	7	23
COMMITTEES	278	1.245	1.582	0	0	0	2	5
AUDIT_COMM	278	0.410						
BOARD_MEMB	279	5.846	3.923	3	3	6	6	20
COMP_MEMB_TA	273	0.00034	0.00048	0.00000	0.00005	0.00013	0.00045	0.00242
VAR_COMP	268	0.493						

N = 332. Varying sample size on the variable level results from missing data. Error year is the fiscal year of an error case. Post year is the first full fiscal year after the publication of the first error announcement related to an error case. Error cases are constructed on firm-year level from all error announcements published until the end of 2014. An error case can comprise one or several errors in the consolidated and individual annual financial statements and in the consolidated and

individual annual management reports. Control cases are firm-years which do not represent error cases in the respective fiscal year. *ENF_REGIME* is a dummy variable for firm-years subject to the enforcement regime. *EQ_LISTING* is dummy variable for firm-years with a market price at the fiscal-year end (WC05001). *AUD_TEAM_ROTATE* is a dummy variable for firms where all signees of the auditor's opinion for the post year are different from the signees of the auditor's opinion of the error year. *AUD_FIRM_ROTATE* is a dummy variable for firms where the audit firm for the post year is different from the audit firm the error year. *AUD_TEAM_ROTATE* and *AUD_FIRM_ROTATE* are measured in post years only. *BIG4* is a dummy variable for firm-years in which Deloitte, EY, KPMG, or PWC is the auditor. *BIG5* is a dummy variable for firm-years in which BDO, Deloitte, EY, KPMG, or PWC is the auditor. *AO_UNQUAL* is a dummy variable for firm-years with an unqualified auditor's opinion. *AO_SUPPL* is a dummy variable for firm-years in which the auditor's opinion contains supplementary notes. *AUDIT_TIME* is the period in days between the fiscal-year end and the date of the respective auditor's opinion. *AUD_FEE_TA* are the audit fees scaled by the average total assets of the fiscal year. *NAS_AUD_RATIO* are the fees for non-audit services charged by the auditor divided by audit fees. *TOT_FEE_TA* is the sum of audit and non-audit services fees scaled by the average total assets of the fiscal year. *BOARD_MEET* is the number of meetings of the supervisory board. *COMMITTEES* is number of committees of the supervisory board. *AUDIT_COMM* is a dummy variable for firm years in which the supervisory board has an audit committee. *BOARD_MEMB* is the number of members of the supervisory board. *COMP_MEMB_TA* is the average compensation of a supervisory board member scaled by the average total assets of the fiscal year. *VAR_COMP* is a dummy variable for firm-years in which the compensation of supervisory board members has a variable component, regardless of whether the respective criteria (e.g., firm performance, dividend payments) are met. All non-dummy variables are winsorized at the 1% and 99% level.

Table 11: Difference-in-differences analysis of corporate governance of matched pairs (unbalanced sample)

(A) *ENF_REGIME*

		Error years (i)	Post years (ii)	(ii) – (i)	
Error cases	(a)	1.000 (N = 83)	0.829 (N = 70)	**–0.171 (0.043)**	***
Control cases	(b)	1.000 (N = 83)	0.800 (N = 70)	**–0.200 (0.044)**	***
	(a) – (b)	0.000 (0.041)	0.029 (0.045)	0.029 (0.061)	

(B) *EQ_LISTING*

		Error years (i)	Post years (ii)	(ii) – (i)	
Error cases	(a)	1.000 (N = 83)	0.934 (N = 76)	**–0.066 (0.027)**	**
Control cases	(b)	1.000 (N = 83)	0.934 (N = 76)	**–0.066 (0.028)**	**
	(a) – (b)	0.000 (0.027)	0.000 (0.028)	0.000 (0.039)	

(C) *AUD_TEAM_ROTATE*

		Post years (ii)
Error cases	(a)	0.552 (N = 58)
Control cases	(b)	0.424 (N = 59)
	(a) – (b)	0.128 (0.092)

(D) *AUD_FIRM_ROTATE*

		Post years (ii)
Error cases	(a)	0.424 (N = 59)
Control cases	(b)	0.237 (N = 59)
	(a) – (b)	**0.186 (0.086)** **

(E) *BIG4*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	0.408 (N = 76)	0.429 (N = 63)	0.021 (0.084)
Control cases	(b)	0.620 (N = 79)	0.590 (N = 61)	–0.030 (0.084)
	(a) – (b)	**–0.212 (0.079)** ***	**–0.162 (0.090)** *	0.051 (0.119)

(F) *BIG5*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	0.566 (N = 76)	0.587 (N = 63)	0.022 (0.083)
Control cases	(b)	0.671 (N = 79)	0.623 (N = 61)	–0.048 (0.083)
	(a) – (b)	–0.105 (0.079)	–0.036 (0.088)	0.069 (0.118)

(Table 11: continued)

(G) *AO_UNQUAL*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	0.921 (N = 76)	0.952 (N = 63)	0.031 (0.030)
Control cases	(b)	1.000 (N = 79)	1.000 (N = 61)	0.000 (0.030)
	(a) – (b)	**–0.079 (0.028) *****	–0.048 (0.032)	0.031 (0.042)

(H) *AO_SUPPL*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	0.197 (N = 76)	0.190 (N = 63)	–0.007 (0.058)
Control cases	(b)	0.114 (N = 79)	0.033 (N = 61)	–0.081 (0.058)
	(a) – (b)	0.083 (0.055)	**0.158 (0.061) ****	0.074 (0.082)

(I) *AUDIT_TIME*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	95.776 (N = 76)	90.492 (N = 63)	–5.284 (5.340)
Control cases	(b)	78.658 (N = 79)	74.230 (N = 61)	–4.429 (5.341)
	(a) – (b)	**17.118 (5.035) *****	**16.263 (5.736) *****	–0.856 (7.553)

(J) *AUD_FEE_TA*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	0.00212 (N = 75)	0.00242 (N = 61)	0.00030 (0.00040)
Control cases	(b)	0.00180 (N = 76)	0.00183 (N = 57)	0.00004 (0.00000)
	(a) – (b)	0.00033 (0.00038)	0.00059 (0.00042)	0.00026 (0.00057)

(K) *NAS_AUD_RATIO*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	0.638 (N = 75)	0.422 (N = 63)	–0.216 (0.161)
Control cases	(b)	0.528 (N = 76)	0.593 (N = 61)	0.065 (0.162)
	(a) – (b)	0.110 (0.154)	–0.171 (0.169)	–0.281 (0.229)

(L) *TOT_FEE_TA*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	0.00307 (N = 75)	0.00295 (N = 61)	–0.00012 (0.00053)
Control cases	(b)	0.00249 (N = 76)	0.00250 (N = 57)	0.00001 (0.00100)
	(a) – (b)	0.00058 (0.00050)	0.00044 (0.00056)	–0.00013 (0.00075)

(Table 11: continued)

(M) *BOARD_MEET*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	6.440 (N = 75)	6.279 (N = 61)	–0.161 (0.521)
Control cases	(b)	6.000 (N = 78)	6.541 (N = 61)	0.541 (0.515)
	(a) – (b)	0.440 (0.488)	–0.262 (0.547)	–0.702 (0.733)

(N) *COMMITTEES*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	0.961 (N = 76)	1.143 (N = 63)	0.182 (0.269)
Control cases	(b)	1.436 (N = 78)	1.459 (N = 61)	0.023 (0.269)
	(a) – (b)	**–0.475 (0.254) ***	–0.316 (0.284)	0.159 (0.380)

(O) *AUDIT_COMM*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	0.329 (N = 76)	0.365 (N = 63)	0.036 (0.084)
Control cases	(b)	0.474 (N = 78)	0.475 (N = 61)	0.001 (0.084)
	(a) – (b)	**–0.145 (0.079) ***	–0.110 (0.089)	0.035 (0.118)

(P) *BOARD_MEMB*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	5.066 (N = 76)	5.429 (N = 63)	0.363 (0.663)
Control cases	(b)	6.481 (N = 79)	6.426 (N = 61)	–0.055 (0.663)
	(a) – (b)	**–1.415 (0.626) ****	–0.998 (0.705)	0.418 (0.938)

(Q) *COMP_MEMB_TA*

		Error years (i)	Post years (ii)	(ii) – (i)	
Error cases	(a)	0.00029 (N = 76)	0.00046 (N = 61)	**0.00017 (0.00008)**	**
Control cases	(b)	0.00029 (N = 79)	0.00037 (N = 57)	0.00008 (0.00000)	
	(a) – (b)	0.00000 (0.00008)	0.00009 (0.00009)	0.00009 (0.00012)	

(R) *VAR_COMP*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	0.425 (N = 73)	0.517 (N = 60)	0.092 (0.087)
Control cases	(b)	0.560 (N = 75)	0.467 (N = 60)	–0.093 (0.087)
	(a) – (b)	–0.135 (0.082)	0.050 (0.092)	0.185 (0.123)

(Table 11: continued)

N = 332. Varying sample size on the variable level results from missing data. Error year is the fiscal year of an error case. Post year is the first full fiscal year after the publication of the first error announcement related to an error case. Error cases are constructed on firm-year level from all error announcements published until the end of 2014. An error case can comprise one or several errors in the consolidated and individual annual financial statements and in the consolidated and individual annual management reports. Control cases are firm-years which do not represent error cases in the respective fiscal year. *ENF_REGIME* is a dummy variable for firm-years subject to the enforcement regime. *EQ_LISTING* is dummy variable for firm-years with a market price at the fiscal-year end (WC05001). *AUD_TEAM_ROTATE* is a dummy variable for firms where all signees of the auditor's opinion for the post year are different from the signees of the auditor's opinion of the error year. *AUD_FIRM_ROTATE* is a dummy variable for firms where the audit firm for the post year is different from the audit firm the error year. *AUD_TEAM_ROTATE* and *AUD_FIRM_ROTATE* are measured in post years only. *BIG4* is a dummy variable for firm-years in which Deloitte, EY, KPMG, or PWC is the auditor. *BIG5* is a dummy variable for firm-years in which BDO, Deloitte, EY, KPMG, or PWC is the auditor. *AO_UNQUAL* is a dummy variable for firm-years with an unqualified auditor's opinion. *AO_SUPPL* is a dummy variable for firm-years in which the auditor's opinion contains supplementary notes. *AUDIT_TIME* is the period in days between the fiscal-year end and the date of the respective auditor's opinion. *AUD_FEE_TA* are the audit fees scaled by the average total assets of the fiscal year. *NAS_AUD_RATIO* are the fees for non-audit services charged by the auditor divided by audit fees. *TOT_FEE_TA* is the sum of audit and non-audit services fees scaled by the average total assets of the fiscal year. *BOARD_MEET* is the number of meetings of the supervisory board. *COMMITTEES* is number of committees of the supervisory board. *AUDIT_COMM* is a dummy variable for firm years in which the supervisory board has an audit committee. *BOARD_MEMB* is the number of members of the supervisory board. *COMP_MEMB_TA* is the average compensation of a supervisory board member scaled by the average total assets of the fiscal year. *VAR_COMP* is a dummy variable for firm-years in which the compensation of supervisory board members has a variable component, regardless of whether the respective criteria (e.g., firm performance, dividend payments) are met. Standard errors for differences in means are provided in braces. */**/*** marks significance at the 10/5/1% level. All non-dummy variables are winsorized at the 1% and 99% level.

Table 12: Difference-in-differences analysis of corporate governance of matched pairs (balanced sample)

(A) *ENF_REGIME*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	1.000 (N = 31)	0.935 (N = 31)	–0.065 (0.039)
Control cases	(b)	1.000 (N = 31)	0.968 (N = 31)	–0.032 (0.039)
	(a) – (b)	0.000 (0.039)	–0.032 (0.039)	–0.032 (0.055)

(B) *EQ_LISTING*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	1.000 (N = 31)	1.000 (N = 31)	0.000 (0.000)
Control cases	(b)	1.000 (N = 31)	1.000 (N = 31)	0.000 (0.000)
	(a) – (b)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)

(C) *AUD_TEAM_ROTATE*

		Post years (ii)
Error cases	(a)	0.484 (N = 31)
Control cases	(b)	0.387 (N = 31)
	(a) – (b)	0.097 (0.127)

(D) *AUD_FIRM_ROTATE*

		Post years (ii)
Error cases	(a)	0.419 (N = 31)
Control cases	(b)	0.258 (N = 31)
	(a) – (b)	0.161 (0.120)

(E) *BIG4*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	0.419 (N = 31)	0.516 (N = 31)	0.097 (0.126)
Control cases	(b)	0.677 (N = 31)	0.581 (N = 31)	–0.097 (0.126)
	(a) – (b)	**–0.258 (0.126) ****	–0.065 (0.128)	0.194 (0.178)

(F) *BIG5*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	0.516 (N = 31)	0.581 (N = 31)	0.065 (0.125)
Control cases	(b)	0.710 (N = 31)	0.581 (N = 31)	–0.129 (0.125)
	(a) – (b)	–0.194 (0.125)	0.000 (0.126)	0.194 (0.177)

(Table 12: continued)

(G) *AO_UNQUAL*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	0.935 (N = 31)	0.968 (N = 31)	0.032 (0.039)
Control cases	(b)	1.000 (N = 31)	1.000 (N = 31)	0.000 (0.039)
	(a) – (b)	–0.065 (0.039)	–0.032 (0.039)	0.032 (0.055)

(H) *AO_SUPPL*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	0.161 (N = 31)	0.194 (N = 31)	0.032 (0.080)
Control cases	(b)	0.065 (N = 31)	0.032 (N = 31)	–0.032 (0.080)
	(a) – (b)	0.097 (0.080)	**0.161 (0.08) ****	0.065 (0.113)

(I) *AUDIT_TIME*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	86.355 (N = 31)	87.452 (N = 31)	1.097 (8.040)
Control cases	(b)	73.161 (N = 31)	74.258 (N = 31)	1.097 (8.007)
	(a) – (b)	13.194 (8.040)	13.194 (8.096)	0.000 (11.370)

(J) *AUD_FEE_TA*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	0.00220 (N = 31)	0.00255 (N = 31)	0.00035 (0.00064)
Control cases	(b)	0.00171 (N = 31)	0.00177 (N = 31)	0.00006 (0.00100)
	(a) – (b)	0.00049 (0.00064)	0.00078 (0.00064)	0.00029 (0.00091)

(K) *NAS_AUD_RATIO*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	0.374 (N = 31)	0.459 (N = 31)	0.084 (0.173)
Control cases	(b)	0.501 (N = 31)	0.529 (N = 31)	0.028 (0.172)
	(a) – (b)	–0.127 (0.173)	–0.070 (0.173)	0.057 (0.245)

(L) *TOT_FEE_TA*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	0.00282 (N = 31)	0.00308 (N = 31)	0.00026 (0.00077)
Control cases	(b)	0.00228 (N = 31)	0.00244 (N = 31)	0.00015 (0.00100)
	(a) – (b)	0.00053 (0.00077)	0.00064 (0.00077)	0.00011 (0.00109)

(Table 12: continued)

(M) *BOARD_MEET*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	6.419 (N = 31)	6.419 (N = 31)	0.000 (0.749)
Control cases	(b)	6.097 (N = 31)	6.452 (N = 31)	0.355 (0.746)
	(a) – (b)	0.323 (0.749)	–0.032 (0.746)	–0.355 (1.059)

(N) *COMMITTEES*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	1.194 (N = 31)	1.323 (N = 31)	0.129 (0.416)
Control cases	(b)	1.742 (N = 31)	1.710 (N = 31)	–0.032 (0.414)
	(a) – (b)	–0.548 (0.416)	–0.387 (0.417)	0.161 (0.588)

(O) *AUDIT_COMM*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	0.452 (N = 31)	0.419 (N = 31)	–0.032 (0.128)
Control cases	(b)	0.548 (N = 31)	0.548 (N = 31)	0.000 (0.128)
	(a) – (b)	–0.097 (0.128)	–0.129 (0.128)	–0.032 (0.181)

(P) *BOARD_MEMB*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	5.903 (N = 31)	5.903 (N = 31)	0.000 (1.121)
Control cases	(b)	6.710 (N = 31)	6.452 (N = 31)	–0.258 (1.116)
	(a) – (b)	–0.806 (1.121)	–0.548 (1.119)	0.258 (1.585)

(Q) *COMP_MEMB_TA*

		Error years (i)	Post years (ii)	(ii) – (i)	
Error cases	(a)	0.00030 (N = 31)	0.00053 (N = 31)	**0.00023 (0.00012)**	*
Control cases	(b)	0.00028 (N = 31)	0.00035 (N = 31)	0.00007 (0.00000)	
	(a) – (b)	0.00002 (0.00012)	0.00018 (0.00012)	0.00015 (0.00018)	

(R) *VAR_COMP*

		Error years (i)	Post years (ii)	(ii) – (i)
Error cases	(a)	0.419 (N = 31)	0.419 (N = 31)	0.000 (0.128)
Control cases	(b)	0.581 (N = 31)	0.484 (N = 31)	–0.097 (0.127)
	(a) – (b)	–0.161 (0.128)	–0.065 (0.128)	0.097 (0.181)

(Table 12: continued)

N = 124. Varying sample size on the variable level results from missing data. Error year is the fiscal year of an error case. Post year is the first full fiscal year after the publication of the first error announcement related to an error case. Error cases are constructed on firm-year level from all error announcements published until the end of 2014. An error case can comprise one or several errors in the consolidated and individual annual financial statements and in the consolidated and individual annual management reports. Control cases are firm-years which do not represent error cases in the respective fiscal year. *ENF_REGIME* is a dummy variable for firm-years subject to the enforcement regime. *EQ_LISTING* is dummy variable for firm-years with a market price at the fiscal-year end (WC05001). *AUD_TEAM_ROTATE* is a dummy variable for firms where all signees of the auditor's opinion for the post year are different from the signees of the auditor's opinion of the error year. *AUD_FIRM_ROTATE* is a dummy variable for firms where the audit firm for the post year is different from the audit firm the error year. *AUD_TEAM_ROTATE* and *AUD_FIRM_ROTATE* are measured in post years only. *BIG4* is a dummy variable for firm-years in which Deloitte, EY, KPMG, or PWC is the auditor. *BIG5* is a dummy variable for firm-years in which BDO, Deloitte, EY, KPMG, or PWC is the auditor. *AO_UNQUAL* is a dummy variable for firm-years with an unqualified auditor's opinion. *AO_SUPPL* is a dummy variable for firm-years in which the auditor's opinion contains supplementary notes. *AUDIT_TIME* is the period in days between the fiscal-year end and the date of the respective auditor's opinion. *AUD_FEE_TA* are the audit fees scaled by the average total assets of the fiscal year. *NAS_AUD_RATIO* are the fees for non-audit services charged by the auditor divided by audit fees. *TOT_FEE_TA* is the sum of audit and non-audit services fees scaled by the average total assets of the fiscal year. *BOARD_MEET* is the number of meetings of the supervisory board. *COMMITTEES* is number of committees of the supervisory board. *AUDIT_COMM* is a dummy variable for firm years in which the supervisory board has an audit committee. *BOARD_MEMB* is the number of members of the supervisory board. *COMP_MEMB_TA* is the average compensation of a supervisory board member scaled by the average total assets of the fiscal year. *VAR_COMP* is a dummy variable for firm-years in which the compensation of supervisory board members has a variable component, regardless of whether the respective criteria (e.g., firm performance, dividend payments) are met. Standard errors for differences in means are provided in braces. */**/*** marks significance at the 10/5/1% level. All non-dummy variables are winsorized at the 1% and 99% level.

III

Monitoring by Individual Investors

Joachim Gassen and Marcus Witzky

Abstract

This study uses large-scale survey evidence from German individual investors to explore the determinants of their monitoring behavior. We expect that individual shareholders either trust the monitoring by other stakeholders or that they engage in monitoring activities themselves. First, we document that a significant share of German individual investors lacks trust in their fellow stakeholders and that the level of trust is only marginally affected by demographic characteristics. Second, we study two aspects of monitoring, acquisition of financial reporting information and voting activity, and show that less trusting investors engage in *less* monitoring. Using structural equation modeling, we document that the main mechanism for this finding is that non-trusting investors tend to have less exposure to the stock market and that exposure is positively related to monitoring activities. Finally, we provide robust evidence that an educational background in economics or business has a positive impact on trust, stock market exposure, and monitoring activities. Hence, improving the financial knowledge of individual investors might increase trust, monitoring activities, and stock market participation.

Keywords: Trust, Stock Market Participation, Monitoring, Financial Reporting, Voting Behavior, Individual Investors, Financial Literacy

JEL Classification: D14, D83, G11, G30, I22, M41

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1 Introduction

Individual investors matter. While the share of U.S. direct stock ownership declined from above 40% in the 1980s to about 20 % in 2007 (French 2008), the category "Corporate Equities held by the Household Sector" hovers fairly constantly around 37% of all equities since 2008 (Federal Reserve Bank, Report Z.1, Table L.213, as of March 12, 2015). In total amounts, at the end of 2014, households and nonprofit firms held publicly traded equity with a market value of around 13.3 trillion US$.[18] This is clearly a sizable fraction of the U.S. equity market.

Prior literature documents on the one hand that at least some individual investors tend to make inefficient portfolio allocations (French 2008; Barber and Odean 2013) and information acquisition decisions (Bhattacharya, Hackethal, Kaesler, Loos, and Meyer 2012). On the other hand, individual investors are important providers of liquidity (Kaniel, Saar, and Titman 2008) and in some cases even help to impound information into price (Kaniel, Liu, Saar, and Titman 2012). Finally, since portfolio theory suggests that investors should distribute their wealth across different asset classes, individual investors withdrawing from equity markets give rise to the so-called "stock market participation puzzle" and might impose a general threat to their wealth and thus, ultimately, general welfare (Hong, Kubik, and Stein 2004). Research in markets and financial intermediation also documents the importance of trust in fostering private investment in equity markets (Guiso, Sapienza, and Zingales 2008; Gennaioli, Shleifer, and Vishny 2015).

While trust is one mechanism to address information asymmetries in markets, monitoring is another. This study uses large-scale survey evidence from German individual investors to explore the determinants of their monitoring behavior. Prior research on the monitoring role

[18] As discussed in detail by French (2008: 1562–1563), the statistic reported by the Federal Reserve Bank also includes preferred stock and closely held corporations. Since French (2008) tries to identify these components for his study, the data presented by him are not directly comparable to the original data of the Federal Reserve Bank.

of investors has focused almost exclusively on institutional investors (Chen, Harford, and Li 2007; Ferreira and Matos 2008). Given the limited stake and amount of time that individual investors have at their disposal, this focus on institutional investors is in line with theory (Grossman and Hart 1980; Shleifer and Vishny 1986). Assuming that individual investors more or less rationally choose to free-ride on the monitoring efforts of institutional investors, one would assume that they provide little effort in monitoring and instead trust their more experienced institutional counterparts to discipline management. However, based on our data, we find that a significant portion of the investors in our sample is not trusting. Instead, they state that they perceive a high risk that other stakeholder groups (management, majority shareholders, other large investors, financial intermediaries) are betraying their wealth position. This finding opens up an interesting array of questions: Are these non-trusting investors more or less engaged monitors? Do they have more or less exposure to the stock market? Does better education affect this risk assessment?

Using 11,260 responses from a large-scale survey of German individual shareholders invested in *Deutsche Post*, we are able to address these questions. We find that "untrusting" investors are less active monitors. We study two different aspects of monitoring. The first is the intensity of financial accounting information acquisition. The second is the likelihood to vote on an annual meeting. Investors that assess agency risks to be higher are both, less likely to acquire financial accounting information and less likely to vote.

In order to understand the mechanics behind this striking correlation, we use structural equation modeling to explore the links between educational background, stock market exposure, trust and monitoring activity. In line with prior literature, we expect trust to influence the level of stock market exposure positively. Also, based on the theoretical argument that trust and monitoring should act as substitutes, we predict trust to be negatively related to monitoring activity. Since they should face lower information processing costs, we expect individual

investors with an educational background in economics or business to have higher stock market exposure and to engage in more monitoring. We also allow for a direct link of the educational background on trust. A priori, this link could be positive or negative. If a lack of trust is based on informed beliefs, than investors with lower information processing cost should be less trusting. If lack of trust is instead related more to insecurity, fear and prejudices than to information, better-informed investors should exhibit higher levels of trust. Finally, we expect that investors with higher stock market exposure engage in more monitoring.

Our data is consistent with better-educated investors having higher levels of stock market exposure, trust and monitoring activities. In addition, as predicted, investors with higher stock market exposure engage more in monitoring activities. Lower levels of trust trigger lower exposure to the stock market but have no direct effect on monitoring activities. In an additional analysis based on *Deutsche Post* affiliates we document that for these investors—who we consider to participate in the stock market for reasons that are exogenous to our analyses—trust has a positive impact on financial reporting information acquisition. Taken together, our findings are consistent with, if anything, trust having a positive impact on monitoring activities. The observed low level of trust in our data seems to be partly due to a lack of financial background and is inconsistent with it being driven by informed critical individual investors.

We contribute to the literature by exploring the monitoring behavior of individual investors. Existing knowledge on this issue is limited on specific activities like attendance of annual meetings (Strickland, Wiles, and Zenner 1996; de Jong, Mertens, and Roosenboom 2006; Carrington and Johed 2007; Harris 2010) and the use and assessment of financial reporting information (Elliott, Hodge, and Jackson 2008; Lawrence 2013; Cascino, Clatworthy, García Osma, Gassen, Imam, and Jeanjean 2014 for a more comprehensive review). In general, little is known about the determinants of monitoring by individual investors. In addition, we contribute to the behavioral finance literature by exploring the determinants and consequences of

trust, a concept that recent literature has argued to be an important component of financial decision making of individual investors (Fehr 2009; Guiso et al. 2008; Gennaioli et al. 2015). In particular, we verify and complement the findings of Guiso et al. (2008) by providing evidence that the level of trust by German individual investors is important for their stock market participation decision. We extent their findings by showing that individual investors with higher levels of economic education tend to show higher levels of trust towards other financial market participants. Also, we document that there is a positive association between trust and monitoring activities that seems to be driven by the educational background in economics or business and the stock market participation decision.

Our findings should also be relevant to regulators since they help to understand a group of investors that is most likely less willing to invest in the stock market. Understanding the mindset of these investors should help to address their concerns. This is a relevant issue from a welfare perspective since individual investors generally benefit from being able to diversify their wealth across different asset classes. This requires them to be either trusting or monitoring. Our results, that remain exploratory due to inherent data limitations, are consistent with investors showing a lack of trust and with investor education positively influencing trust, stock market participation and monitoring activities.

2 Background

As discussed in the introduction, individual investors hold a sizable portion of the organized equity market, either directly or indirectly via funds. However, prior literature generally finds that individual investors hold suboptimal portfolios and thus realize suboptimal returns since they tend to be under-diversified (Dorn and Hubermann 2005), fail to incorporate new information (Bhattacharya et al. 2012) and are subject to behavioral biases (Barber and Odean 2008; for an early overview on the behavior of individual investors see de Bondt 1998). While some research also identifies settings where individual investors seem capable to trade on

private information (Kaniel et al. 2012), this generally supports the notion that individual investors fail to incorporate all available information when making investment decisions.

Another reason for this finding is that a sizable portion of individual investors can be regarded as (partly) financially illiterate. Financially literacy is significantly associated with the amount of education that investors received (van Rooij, Lusardi, and Alessie 2011). Given that effects of financial literacy on financial behavior are generally evaluated to be larger when financial literacy is assessed rather than administered through an experiment (Fernandes, Lynch Jr., and Netemeyer 2014), it remains an open issue whether financial literacy is itself causal for financial behavior or whether more fundamental skills like intelligence and numeracy drive the differences in financial decision making.

Another influential determinant of stock market participation is trust (Guiso et al. 2008). While definitions of trust vary throughout the literature, in principal trust can be defined as a behavior or as a belief (Fehr 2009). The former can only be measured by experimental game setups like the gift exchange game. The latter is assessable via survey questions. In a study based on Dutch and Italian survey data, Guiso et al. (2008) provide evidence that trusting investors are more likely to invest in the stock market, are relatively more diversified and hold larger portfolios. They also provide evidence that the influence of trust seems to be different from the effects of risk aversion and ambiguity. While our results confirm the findings of Guiso et al. (2008) for a large sample of German investors, we are also able to explore another important aspect of financial behavior: the monitoring activities of individual investors. Prior literature (Ferrin, Bligh, and Kohles 2007; Fehr 2009) predicts that monitoring and trust should be substitutes. Based on this we would expect less-trusting investors to be more engaged in monitoring activities. If, however, untrusting investors are also not confident that they can efficiently monitor their investment, then we would expect the opposite.

With respect to the monitoring activities of individual investors, we first briefly review the literature on information acquisition. Prior evidence documents that individual investors generally prefer filtered verbal information to quantitative non-filtered financial data (Elliott et al. 2008). While the overall literature on the effect of information usage on trading performance is mixed, recent studies indicate that returns are better when the information is easier to read and process (Lawrence 2013). Experimental evidence also supports that more readable disclosures lead to stronger reactions from individual investors (Rennekamp, JAR 2012). In general, research shows that more experienced investors focus more on opaque firms and rely more on quantitative data relative to less experienced individual investors (Lawrence 2013).

Turning to the voting behavior of investors, almost the entire literature focuses on coordinated activities by institutional investors or groups of shareholder activists.[19] Smith (1996) documents firms that were attacked by the California Public Employees' Retirement System (CalPERS) to engage in governance changes and to experience positive market reactions but no change in operating performance. Karpoff, Malatesta, and Walkling (1996) find little evidence that shareholder proposals have a clear effect on firm value. Gillan and Starks (2000) document that the nature of the shareholder putting forth the proposal matters for the likelihood of success and—measured by market reaction—institutional investors and coordinated institutional investors are most likely to succeed. In line with this, Strickland, Wiles, and Zenner (1996) study activities of the United Shareholder Association over the period 1986 to 1993 to show that coordinated monitoring activity by small shareholders can positively affect shareholder value. For individual proposals by small Japanese shareholders however, Yeh (2014) shows no significant market reaction, indicating that these proposals seem to fail to affect firm value. Finally, Del Guercio, Seery, and Woidtke (2008) provide evidence that "just say no" campaigns around elections can induce boards to take action in the interest of share-

[19] Due to the richness of the according literature, this review is superficial and focuses on individual investors. For a more detailed and balanced picture, refer to Renneboog and Szilagyi (2011).

holders. Taken together, prior evidence provides little support for shareholder activism of individual investors to have a direct effect on corporate governance and firm value. However, it also hints at voting being a mechanism to express concerns about managerial behavior.

Summing up the findings of this section, we expect the monitoring behavior of individual investors to be influenced by their (lack of) resources and educational background, by their level of trust and by their demand for information as well as by their incentives to express their views about firm behavior.

3 Empirical analysis

3.1 Data and sample development

To explore the monitoring behavior of individual investors, we use survey data from Ernst, Gassen, and Pellens (2009), a large-scale descriptive study of information needs, dividend preferences and voting behavior of German equity investors. For our study, we focus on the data about individual investors only. Since it is not possible to identify the basic population of all German individual investors, Ernst et al. (2009) conducted their survey in cooperation with *Deutsche Post*, a German blue chip from the logistics industry with registered stocks. On December 14, 2007 the survey questionnaire was sent by the CFO of *Deutsche Post* to all its 465,321 shareholders who were natural persons with residence in Germany. In line with that, we define individual investors as those who buy stocks using their personal name and not a legal name. The survey period ended on January 22, 2008. By then, 44,321 questionnaires or 9.5% had been returned. The CFO of *Deutsche Post* had emphasized in a cover letter to the individual investors that the survey was not concerned with the stocks of *Deutsche Post* in particular but with stock market investments in general.

For our study, we exclude all questionnaires with missing answers on demographic items used in our analysis (7,924). In the next step, we identify erroneous answers on any relevant

item and exclude these questionnaires, as well (521). Questionnaires of investors who stated that they had delegated their investment decisions to other persons (2,165) and of investors aged less than 18 years (30) are removed from the sample. Furthermore, all questionnaires of investors who are current or former employees of *Deutsche Post* are excluded because their response pattern might be biased due to their personal ties to the company that sent the questionnaires (4,005). Finally, we exclude all questionnaires with missing answers on any agency risk or monitoring item used in our study (18,416). This yields a final sample of 11,260 questionnaires for our main analysis. Table 1 summarizes the sample development.

[Table 1 about here]

Individual investors were asked to provide local identifiers indicating their area of residence. We connect these identifiers with the current 402 administrative districts of Germany (NUTS 3 regions: *Landkreise* and *kreisfreie Städte*). Thus, we are able to include economic and cultural attributes for each individual investor's district of residence into our analysis. All district-level data is obtained from *Regionaldatenbank Deutschland*, a joint database of the Federal Statistical Office of Germany and the statistical offices of the federated states of Germany.

3.2 Trust in stakeholders

Our measure of trust in stakeholders is based on a question concerning the betrayal risk perceived by individual investors: *How high do you rate the probability of betrayal by the following parties, negatively affecting your wealth position?*[20] With respect to four different stakeholder groups, the probability could be rated as very low, low, moderate, high, or very high. Table 2 provides the response pattern for the questionnaire items. On average, the high-

[20] Original question in German: *Wie groß schätzen Sie die Wahrscheinlichkeit, dass sich folgende Parteien auf Ihre Kosten bereichern?*

est betrayal risk is perceived to arise from the management, followed by the majority shareholder and by financial intermediaries. Other large investors occupy the last rank.

We conduct a principal component analysis in order to evaluate potential redundancy between the four questionnaire items because they might represent a common construct of trust. For the analysis, we use ones as prior communality estimates and the principal axis method to extract the components. Only the first principal component displays an eigenvalue greater than one. In line with that, a scree test suggests that only the first component is meaningful, which accounts for 55.1% of the total variance in the response pattern. Since only one component is retained, a rotation is neither necessary nor feasible. With respect to the unrotated factor pattern, an item is said to load on the component if the factor loading is 0.4 or greater (Stevens 1992), which is the case for each stakeholder group. Thus, we interpret the first component as a comprehensive measure for trust. Since we are interested in trust rather than betrayal risk, we multiply the first component with –1 and label it *TRUST,* representing the trust in stakeholders by individual investors. The principal component analysis is summarized in Appendix B.

[Table 2 about here]

Next, we examine potential associations between trust and demographic characteristics of the individual investors in our final sample. Table 3 summarizes the distribution of the variables. As a result of the principle component analysis, *TRUST* is standardized with a mean of zero and a variance of one. 89.9% of our sample are men *(MALE).* On average, the individual investors are 54 years old *(AGE).* For the subsequent univariate and multivariate analyses, we use the natural logarithm of *AGE.* 37.6% have completed vocational training or academic education in economics or business *(ECON).* The level of general education is represented by *EDU.* 56.2% completed academic education and further 4.7% had academic education without obtaining a degree; 38.9% hold different types of high school degrees and 0.2% do not

have a high school degree. *ECON_EDU* is the interaction of *ECON* and *EDU,* indicating the level of general education conditional on having vocational training or academic education in economics or business. *HOUSING* represents the housing situation. 64.3% live in their own house and 12.1% in a condominium; the remaining either have rented a house or apartment (21.8%) or live at their parent's residence (1.9%).

Based on the districts of residence, we construct several variables for the economic and cultural environment of the individual investors. *PRODUCTIVITY* measures the gross domestic product in Euro of a district for 2007 divided by the persons in employment. For the subsequent univariate and multivariate analyses, we use the natural logarithm of *PRODUCTIVITY. UNEMPLOYMENT* is the average unemployment rate of a district for 2007. *FOREIGNERS* is the share of inhabitants of a district without German citizenship. *TURNOUT* is the voters turnout in a district for the federal elections of 2005. *CONSERVATIVE* is the share of votes for the five major German political parties that was collected by the Christian Democrats (CDU/CSU) or the Liberals (FDP) in the federal elections of 2005 in a district. *PARISHIONERS* is the share of inhabitants of a district who are members of the Roman Catholic Church or the Evangelical Church in Germany based on the 2011 census. Both churches are organized as corporations under German public law and represent the two major religious denominations in Germany. *CATHOLICS* is the number of members of the Roman Catholic Church divided by all members of the Roman Catholic Church and the Evangelical Church in Germany in a district based on the 2011 census. *EAST_GERMANY* is a dummy variable for individual investors who reside in the former German Democratic Republic including the whole of Berlin (12.4%).

[Table 3 about here]

Table 4 provides Pearson and Spearman correlations for trust and the demographic characteristics. With respect to the personal attributes, *TRUST* is significantly positively correlated

with *MALE*, *ECON* and *ECON_EDU;* significant negative correlations exist with *LN_AGE* and with *HOUSING*. Figure 1 shows the average value of *TRUST* by six age classes. The youngest seem to be the most trusting investors while the least trusting ones are not the eldest but the group of the 55–64 year-old investors. Figure 2 depicts the average value of *TRUST* by the four levels of *ECON_EDU*. While *TRUST* is below the sample mean for investors without any educational background in economics or business, it is well above the sample mean for investors with such a background regardless of their level of general education.

[Table 4 about here]

[Figure 1 about here]

[Figure 2 about here]

For a deeper understanding of potential determinants of *TRUST*, we provide a regression analysis in Table 5. While the first three models regress the independent variables on TRUST using OLS, the fourth models estimates the probability of having a TRUST level greater than or equal to the sample median using a logit approach. Since Figure 1 suggests a non-linear relation between *TRUST* and age, we include the respective age classes as fixed effects in all regression models. The district-level variables for the economic and cultural environment are added in the second model. Instead of these variables, district fixed effects are included in the third and fourth model. *MALE* and *ECON* are significantly positive in all models. Results for age classes are mixed, however, the 40–54 years class and the 55–64 years class are negatively significant across all models. With respect to the district-level variables defined above, only *LN_PRODUCTIVITY* and *EAST_GERMANY* are (positively) significant. It is noteworthy that the R^2 (adjusted or Nagelkerke) of the regression models ranges between 0.005 and 0.018 for the OLS models and equals 0.061 for the logit model. Thus, the demographic characteristics available can explain *TRUST* to a limited extent only.

[Table 5 about here]

3.3 Monitoring behavior

Financial accounting information acquisition

Individual investors were asked to assess the relevance of seven different information sources for making their investment decisions. (i.e., buying and selling stocks).[21] The relevance could be rated as very low, low, moderate, high, or very high. Table 6 summarizes the response pattern. On average, the most relevant information source for individual investors is the media (i.e., newspapers, magazines, and business programs on television or the internet), followed by the annual report (including the financial statements). The other information sources in decreasing order of relevance are: advisory by banks and brokers, the interim report, investor relation releases, the company website, and the social circle (i.e., family and friends).

[Table 6 about here]

In Table 7, we present a subsample analysis of the average relevance of information sources for investment decisions by *TRUST*. For the five most important information sources, the assessed relevance is significantly greater in the high-trust subsample (*TRUST* ≥ median). No significant difference is documented for the company website, while the social circle is the only information source with a significantly greater relevance in the low-trust subsample. Thus, individual investors with high trust tend to assess most information sources as more relevant, regardless of whether these are provided by the investment targets itself or by third parties. The ranking of the information sources does not differ between the subsamples.

[Table 7 about here]

Next, we focus on the annual report as the most relevant information source that is provided by an investment target. Individual investors were asked how intensively they use

[21] Original question in German: *Welche Informationsquellen nutzen Sie für Ihre Aktienkauf- oder -verkaufsentscheidungen und wie beurteilen Sie diese [hinsichtlich ihrer Bedeutung]?*

twelve individual components of the annual report.[22] The intensity could be rated as very low, low, moderate, high, or very high. Table 8 summarizes the response pattern. On average, the three most intensively used components are the income statement, the balance sheet, and the management report, while the least intensively used components are the notes and the auditor's opinion.

[Table 8 about here]

Table 9 provides the subsample analysis of the intensity of use of the annual report components by *TRUST*. For nine of the twelve components, the intensity of use is significantly greater in the high-trust subsample (*TRUST* ≥ median). No significant differences are documented for the statement of changes in equity and for the auditor's opinion. The remuneration report is the only component for which the intensity of use is significantly greater in the low-trust subsample. For five components, their rank differs between the subsamples.

[Table 9 about here]

Since we are especially interested in the acquisition of financial accounting information, we conduct a principal component analysis of the eight annual report components which are part of the financial statements: the income statement, the balance sheet, the management report, the statement of changes in equity, the cash flow statement, the segment reporting, the auditor's opinion, and the notes. Thus, we evaluate potential redundancy between the respective items because the might represent a common construct. For the analysis, we use ones as prior communality estimates and the principal axis method to extract the components. Only the first principal component displays an eigenvalue greater than 1. In line with that, a scree test suggests that only the first principal component is meaningful, which accounts for 62.3% of the total variance in the response pattern. Since only one principal component is retained, a rotation is neither necessary nor feasible. With respect to the unrotated factor pattern, an item

[22] Original question in German: *Wie intensiv nutzen Sie die einzelnen Teile des Geschäftsberichts?*

is said to load on the principal component if the factor loading is 0.4 or greater (Stevens 1992), which is the case for all items. Thus we label the first principal component *FINACC* and interpret it as the intensity of financial accounting information acquisition by individual investors. The principal component analysis in summarized in Appendix C.

Exercise of shareholder voting rights

Our second proxy for monitoring behavior is based on a questionnaire item where individual investors had to indicate the extent of their past or intended exercise of shareholder voting rights.[23] Potential answers were (1) having never voted and no intention to do so, (2) having never voted but intending to delegate the voting right to a proxy for the next annual meeting, (3) having never voted but intending to visit the next annual meeting, (4) having voted by delegation to a proxy, and (5) having voted personally at an annual meeting. We construct a simple variable bound by zero and one to represent these five potential answers and label it *VOTING.*

Monitoring behavior and investor characteristics

We examine potential associations between the monitoring behavior of individual investors, their trust in stakeholders, and other personal characteristics. Table 10 provides the variable distribution. As a result of the principle component analysis, *FINACC* and *TRUST* are standardized with means of zero and variances of one. With respect to *VOTING,* 66.5% have exercised their voting rights already, either personally or by delegation to a proxy. 13.8% intend to visit the next annual meeting or to authorize a proxy while the remaining 19.7% have neither voted in the past nor intend to do so with respect to the next annual meeting. We use the interaction term *ECON_EDU,* i.e., the level of general education conditional on having vocational training or academic education in economics or business, in the subsequent anal-

[23] Original question in German: *Als Aktionär haben Sie ein Stimmrecht. Haben Sie dies im Rahmen einer Hauptversammlung (HV) bereits in Anspruch genommen oder planen Sie eine Inanspruchnahme?*

yses as an inverse proxy for the costs of monitoring. The variables *%STOCKS, #FIRMS,* and *HORIZON* are introduced in order to proxy for the stock market exposure of individual investors and thus to represent the benefits of monitoring. *%STOCKS* is the share of wealth—excluding the own residence—that is invested in stocks except mutual funds. The average individual investor has 29.8% of his wealth invested in stocks and 14.9% of the investors have invested more than half of their wealth in stocks. *#FIRMS* is the number of firms of which stocks are held. On average, stocks of eleven different firms are held by an individual investor. 3.8% hold stocks of more than 30 different firms. *HORIZON* represents the investment horizon. 76.2% state that they are interested in the long-term formation of wealth, 20.0% seek regular income from dividends or trading and 3.8% focus on short-term gains. The remaining four variables are controls that we do not assume to represent costs or benefits of monitoring. *MALE, AGE,* and *HOUSING* were introduced above, already. *YEARS* represents the number of years having been invested in stocks except mutual funds. On average, this period amounts to 17.6 years. For the subsequent univariate and multivariate analyses, we use the natural logarithm of one plus *YEARS*.

[Table 10 about here]

Table 11 presents Pearson and Spearman correlations for monitoring proxies and investor characteristics. *FINACC* and *VOTING* are significantly positively correlated with *TRUST* and with most of the controls. *HORIZON* is significantly negatively correlated with both monitoring proxies while the Spearman correlation between *VOTING* and *HOUSING* is insignificant. As an example, Figure 3 depicts the average levels of *TRUST* by the different response levels for the intensity of use of the income statement, which is the most intensively used component of *FINACC*. Figure 4 presents the average levels of *TRUST* by the different response levels for *VOTING*.

[Table 11 about here]

[Figure 3 about here]

[Figure 4 about here]

In order to examine potential associations between the monitoring proxies and investor characteristics in more depth, we conduct several regression analysis in Table 12. We use OLS regressions for the continuous dependent variable *FINACC*. In the first model, *TRUST* and the controls which we interpret as proxies for costs and benefits of monitoring are used as independent variables. All of them are significantly positively associated with *FINACC,* except *HORIZON,* for which we document a significant negative association. The results remain stable when we add the remaining controls in the second model. The only exemption is *HORIZON,* which turns insignificant. We get similar results when examining the voting behavior. However, since *VOTING* is not continuous but consists of five response levels, we use logit regressions in that case.

[Table 12 about here]

3.4 Structural equation modeling

Intuitively, we would expect that trusting investors engage in less monitoring. In contrast, we documented positive associations between trust in stakeholders and our two monitoring proxies: financial accounting information acquisition and the exercise of shareholder voting rights. In the following, we use structural equation modeling to examine potential mechanisms driving these associations. Especially, the positive relation between trust and monitoring might partly be due to backdoor effects via investor characteristics that are associated with both concepts. Our proposed structural equation model to be tested is summarized in Figure 5. First, we model a direct effect of trust on monitoring, and we expect it to be negative. Trust is a latent construct measured inversely by the respective four questionnaire items for agency risk perception as reflective indicator variables (omitted in the figure). Monitoring is either a latent construct for financial accounting information acquisition or the variable *VOTING*.

Second, we use *ECON_EDU* as an inverse proxy for the costs of monitoring and thus, we expect it to have a positive effect on monitoring. The extent of trust in stakeholders might depend on the acquired knowledge about economic activities and interrelations. Therefore, we allow *ECON_EDU* to have an effect on trust, as well. However, we do not have an expectation for the respective sign. Third, we introduce stock market exposure, a latent construct to represent the benefits of monitoring. The variables *%STOCKS, #FIRMS* and *HORIZON* are used as reflective indicator variables for stock market exposure (omitted in the figure). Higher levels of *%STOCKS* should increase the stake at risk, and higher levels of *#FIRMS* or *HORIZON* should increase the accumulated probability that stakeholders negatively affect an individual investor's wealth position. We expect investors with a greater stock market exposure to engage more in monitoring. Furthermore, investors with low levels of trust are expected to rather shun the stock market and thus to have lower stock market exposure. This would imply a positive effect of trust on stock market exposure. Finally, we expect investors with high levels of *ECON_EDU* to have a greater stock market exposure.

[Figure 5 about here]

We use maximum-likelihood estimation for the structural equation modeling. For each latent construct in the model, the path to one of its indicator variables is fixed to one in order to scale the latent construct. The degrees of freedom are greater than zero for each model estimated, thus satisfying the t rule as necessary condition for the identification of a model (Bollen 1989). All estimated covariance matrices are positively definite and no negative variances are encountered during the estimations. We present standardized solutions in which the variances of independent variables are fixed to one and parameter values are bound by zero and one. To assess the fit of our model estimations, i.e., how well a model estimation is able to replicate the covariance matrix of the data, we use (1) the Adjusted Goodness of Fit Index (AGFI), (2) the Comparative Fit Index (CFI), and (3) the Root Mean Square Error of Approx-

imation (RMSEA). Typically, AGFI and CFI greater than or equal to 0.90 (0.95) are considered as a reasonable (good) fit (Lei and Wu 2007), and a RMSEA less than or equal to 0.08 (0.05) is considered as a reasonable (good) fit (MacCallum, Browne, and Sugawara 1996). Additionally, we provide the Chi² values for the null hypothesis that the covariance matrix of the data equals the covariance matrix implied by the model. However, it is not uncommon that for large samples this hypothesis is rejected although the model might fit the data well.

Figure 6 presents the modeling solution with financial accounting information acquisition as monitoring proxy. This latent construct is measured by the eight questionnaire items for the intensity of use of financial statements components as reflective indicator variables (omitted in the figure). The direct effect of trust on financial accounting information acquisition is insignificant. All remaining parameters are significant and show the expected sign. The effect of *ECON_EDU* on trust is positive. Of the indicator variables, *HORIZON* is the only one with an insignificant parameter. The fit measures indicate a reasonable fit. Taken together, the solution suggests that the positive association between trust and financial accounting information acquisition we have documented is a joint effect of three mechanisms. First, individual investors with an educational background in economics or business tend to be more trusting and to engage more in information acquisition. Second, these investors tend to have greater stock market exposure which tends to result in more information acquisition, as well. Third, more trusting investors tend to have greater stock market exposure in general and thus tend to engage more in information acquisition.

[Figure 6 about here]

Figure 7 provides the modeling solution with *VOTING* as monitoring proxy. In terms of parameter signs and significance levels, it is in line with the previous solution for financial accounting information acquisition. AGFI and CFI suggest a good fit while RMSEA is close to the good-fit threshold. The same mechanisms suggested above seem to jointly explain the

overall positive association between trust and the exercise of shareholder voting rights we have documented. Again, the solution suggests no direct effect of trust on monitoring.

[Figure 7 about here]

Table 13 presents a summary of the fit measures for the two modeling solutions presented above. Our final sample consists of questionnaires only which provide a full set of answers on all monitoring items used throughout this paper. As a robustness check, we re-estimate our proposed model using relaxed samples allowing monitoring items to be missing if not required for the respective modeling solution. Thus, our sample size increases by 68.6% for the solution regarding financial accounting information acquisition and by 129.6% for the solution regarding *VOTING*. The respective fit measures are presented in Table 13, as well, and are in line with the fit measures of the solutions based on the final sample. However, when using relaxed samples, the parameter for the direct effect of trust on monitoring is significant in both cases. Since the signs are—against expectation—positive, this might hint at the existence of additional mechanisms connecting trust and monitoring.

[Table 13 about here]

3.5 Monitoring behavior by *Deutsche Post* affiliates

For the final sample examined above, all current or former employees of *Deutsche Post* were excluded because their response pattern might be biased due to their personal ties to the company that sent the questionnaires. Furthermore, *Deutsche Post* affiliates are highly likely to have been provided with *Deutsche Post* stocks as part of an employee compensation package. Thus, their stock holdings are—at least to some extent—not based on independent investment decisions.

While this generally is undesirable for our main analyses, the sample of *Deutsche Post* affiliates allows us to explore a sample where the stock market participation decision is likely to

be more exogenous with respect to our main variables of interest. This enables us to explore the effect of trust and our other independent variables on monitoring activities in a setting where omitted variables explaining the stock market participation decision are less likely to bias our inferences.

We construct a sample of all *Deutsche Post* affiliates who are invested in one firm only. By survey design, this investment is *Deutsche Post.* Besides, we apply the same data restrictions as for the final sample, which yields us a sample of 180 individuals. Table 14 provides a comparison of trust, monitoring, and controls between the final sample and *Deutsche Post* affiliates with one investment only. On average, there is no significant difference for *TRUST* and *FINACC.* With respect to voting, *Deutsche Post* affiliates are less likely to exercise their shareholder voting rights at the annual meeting of *Deutsche Post.* In terms of demographics, *Deutsche Post* affiliates are less educated, have a smaller portion of their wealth invested into the stock market, a shorter investment horizon, less years of investment experience, are more likely to be female, younger and less wealthy situated in terms of housing. In other words and in line with our expectations, they are atypical investors.

[Table 14 about here]

Table 15 presents regression analyses of *TRUST, FINACC,* and *VOTING* for *Deutsche Post* affiliates with one investment only. With respect to trust in stakeholders, only *MALE* is significant. Financial accounting information acquisition is significantly associated with *TRUST,* but there is neither a significant association with *ECON_EDU* nor with *%STOCKS.* With respect to *VOTING,* the only significant associations exist with *ECON_EDU* and with younger investors, who have a lower levels of *VOTING*. While the small sample size is significantly reducing the power of our tests, we take special interest in the positive and significant coefficient of *TRUST* on *FINACC*. This is consistent with trust having a positive impact on monitoring, even in a setting where the mechanism via the stock market participation decision

can be assumed to be less important. We conclude from this additional analysis, that, if anything, trust has a positive impact on monitoring activities, in particular with respect to the information acquisition decision.

[Table 15 about here]

4 Conclusion

We document that the monitoring behavior of German individual investors is predominantly influenced by their educational background in economics or business and their level of stock market participation. Our investors show a surprisingly low level of trust. This low level of trust seems to be influenced by a lacking educational background in economics or business and is associated, in line with prior literature, with lower levels of stock market participation. Opposite to what might be expected, after controlling for these factors in a structural equation model, there is no direct link between trust and monitoring behavior. For a sub-sample of investors for which the stock market participation decision tends to be more exogenous (*Deutsche Post* affiliates), we document a positive association of trust and monitoring.

Based on these findings, which we consider to be exploratory due to inherent design limitations, we cautiously conclude that, if anything, trust is positively related to monitoring. This indicates that a lack of trust is not triggering monitoring activities. Thus, monitoring as a potential mechanism to mitigate trust problems is not observable in our data. Instead, untrusting individual investors tend to vote with their feet. Since trust is also suspected to be an important piece of the stock market participation puzzle, this result is also relevant for regulators interested in increasing the level of stock market participation for individual investors. Our findings are consistent with increasing trust in capital market participants potentially leading to more and also more active individual investors. Based on our findings, a main means to increase trust, stock market participation and monitoring activities by individual investors might be to increase their financial knowledge via education.

Appendix A: Variable definitions

Variable	Definition
#FIRMS	Number of firms of which stocks are held
%STOCKS	Share of wealth (excluding own residence) that is invested in stocks except mutual funds
AGE	Age
CATHOLICS	Number of members of the Roman Catholic Church divided by all members of the Roman Catholic Church and the Evangelical Church in Germany in the district of residence based on the 2011 census
CONSERVATIVE	Share of votes for the five major German political parties that was collected by the Christian Democrats (CDU/CSU) or Liberals (FDP) in the district of residence in the federal elections of 2005
EAST_GERMANY	Dummy for residence in the former German Democratic Republic including the whole of Berlin
ECON	Dummy for having vocational training or academic education in economics or business
ECON_EDU	Level of general education conditional on having vocational training or academic education in economics or business (*ECON * EDU)*
EDU	Level of general education
	0.0 — No high school degree
	0.2 — Lower high school degree *(Hauptschule)*
	0.4 — Intermediate high school degree *(Realschule)*
	0.6 — Upper high school degree *(Gymnasium)*
	0.8 — Academic education, not completed
	1.0 — Academic education, completed
FINACC	Principal component representing the intensity of financial accounting information acquisition
FOREIGNERS	Share of inhabitants of the district of residence without German citizenship end of 2007
HORIZON	Investment horizon
	0.0 — Short-term gains
	0.5 — Regular income from dividends or trading
	1.0 — Long-term formation of wealth

HOUSING	Level of the housing situation
	0.167 — At parents' residence
	0.333 — Rented apartment
	0.500 — Rented house
	0.667 — Condominium
	0.833 — Own non-detached house
	1.000 — Own detached house
LN_AGE	Natural logarithm of age
LN_PRODUCTIVITY	Natural logarithm of gross domestic product in Euro divided by persons in employment of the district of residence for 2007
LN_YEARS	Natural logarithm of one plus the number of years having been invested in stocks except mutual funds
MALE	Dummy for being male
PARISHIONERS	Share of inhabitants of the district of residence who are members of the Roman Catholic Church or the Evangelical Church in Germany based on the 2011 census
PRODUCTIVITY	Gross domestic product in Euro divided by persons in employment of the district of residence for 2007
TRUST	Principal component representing the trust in stakeholders
TURNOUT	Voters turnout in the district of residence for the federal elections of 2005
UNEMPLOYMENT	Average unemployment rate of the district of residence for 2007
VOTING	Past or intended exercise of shareholder voting rights
	0.00 — Not voted, no intention to do so at the next annual meeting
	0.25 — Not voted, intention to delegate voting right to a proxy for the next annual meeting
	0.50 — Not voted, intention to visit the next annual meeting
	0.75 — Voted by delegation to a proxy
	1.00 — Voted personally at an annual meeting
YEARS	Number of years having been invested in stocks except mutual funds

Appendix B: Principle component analysis of agency risk perception

Stakeholder	PC1	h^2
Management	**0.60**	0.36
Majority shareholder	**0.82**	0.67
Financial intermediaries	**0.67**	0.45
Other large investors	**0.85**	0.73

N = 11,260. The principal components analysis uses ones as prior communality estimates and the principal axis method to extract the components. Column headed h^2 presents final communality estimates. Bold values indicate factor loadings of 0.40 or greater for the respective component. We multiply the first principal component with –1 and label it *TRUST*.

Appendix C: Principal component analysis of financial accounting information acquisition

Financial statements components	PC1	h^2
Income statement	**0.84**	0.70
Balance sheet	**0.81**	0.66
Management report	**0.74**	0.55
Statement of changes in equity	**0.81**	0.65
Cash flow statement	**0.84**	0.70
Segment reporting	**0.81**	0.66
Auditor's opinion	**0.68**	0.46
Notes	**0.78**	0.61

N = 11,260. The principal components analysis uses ones as prior communality estimates and the principal axis method to extract the components. Column headed h^2 presents final communality estimates. Bold values indicate factor loadings of 0.40 or greater for the respective component. We label the first principal component *FINACC*.

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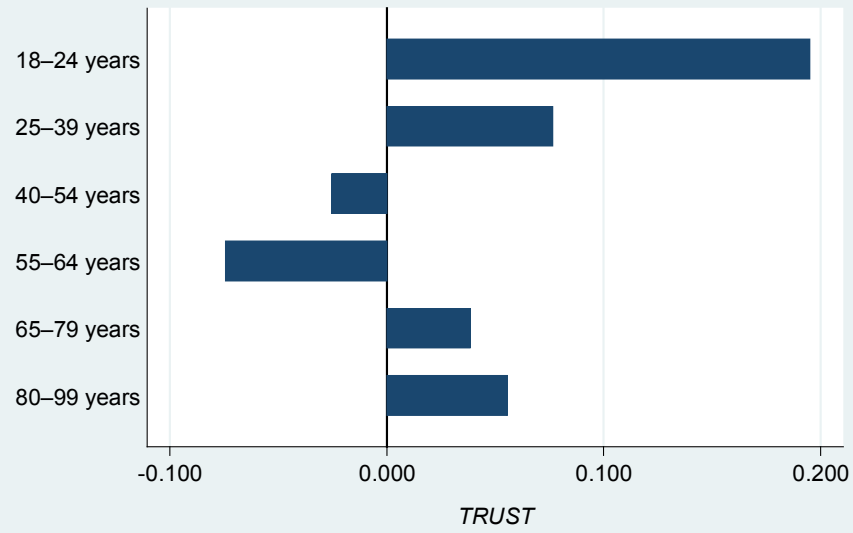
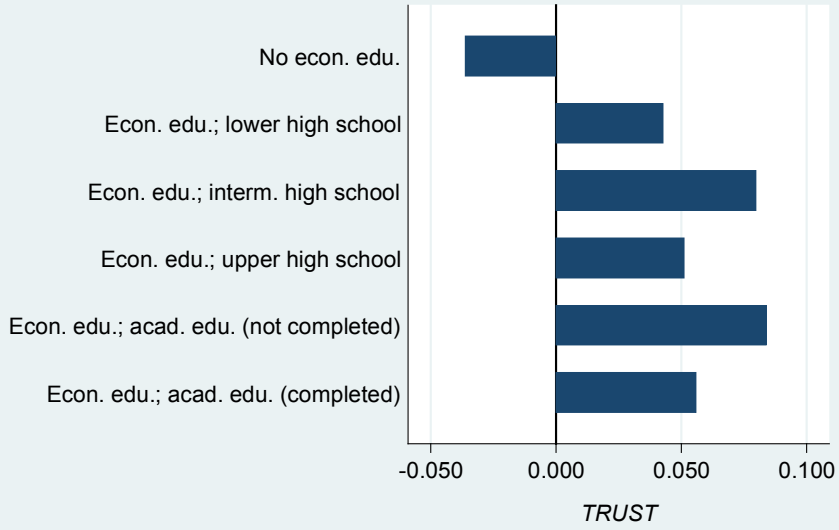
Figure 1: Average trust in stakeholder by age class



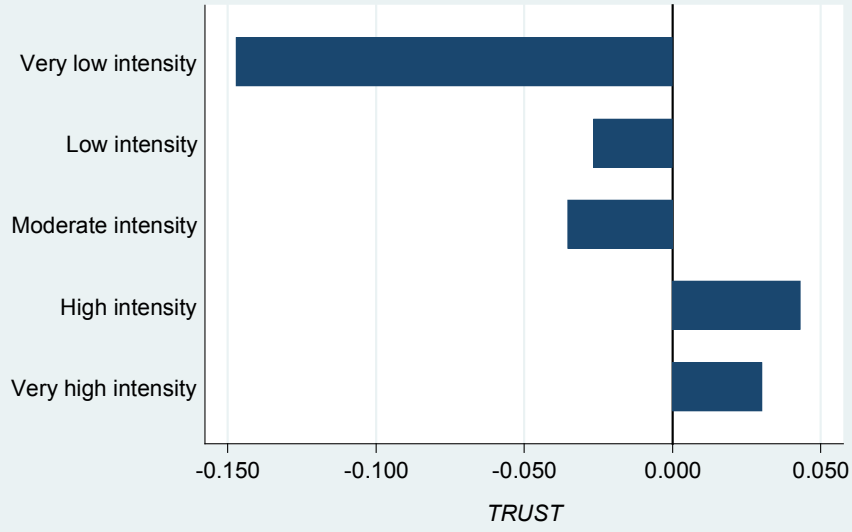
TRUST is a principal component representing the trust in stakeholders.

Figure 2: Average trust in stakeholder by economic and general education



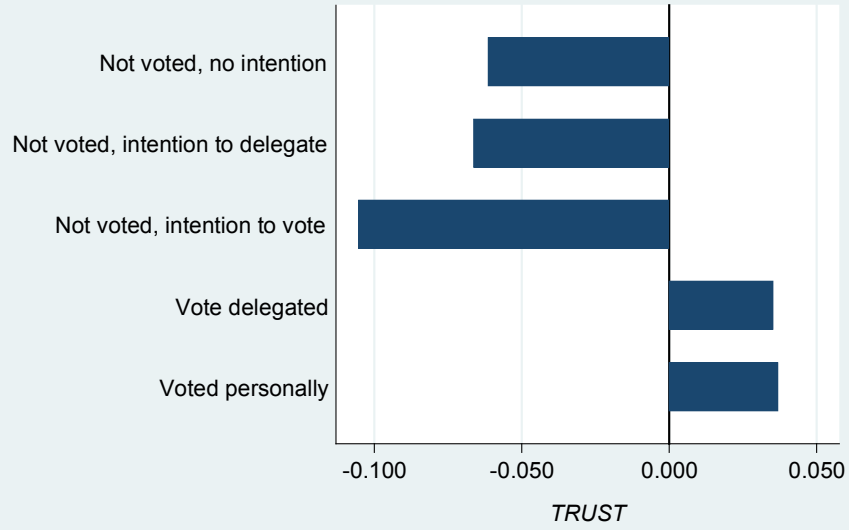
TRUST is a principal component representing the trust in stakeholders.

Figure 3: Average trust in stakeholder by intensity of income statement use



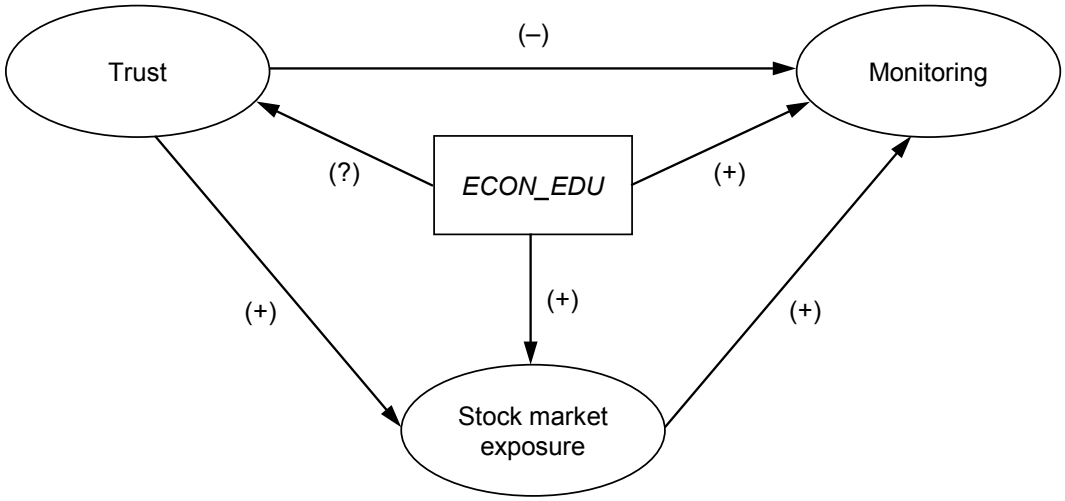
TRUST is a principal component representing the trust in stakeholders.

Figure 4: Average trust in stakeholder by voting behavior



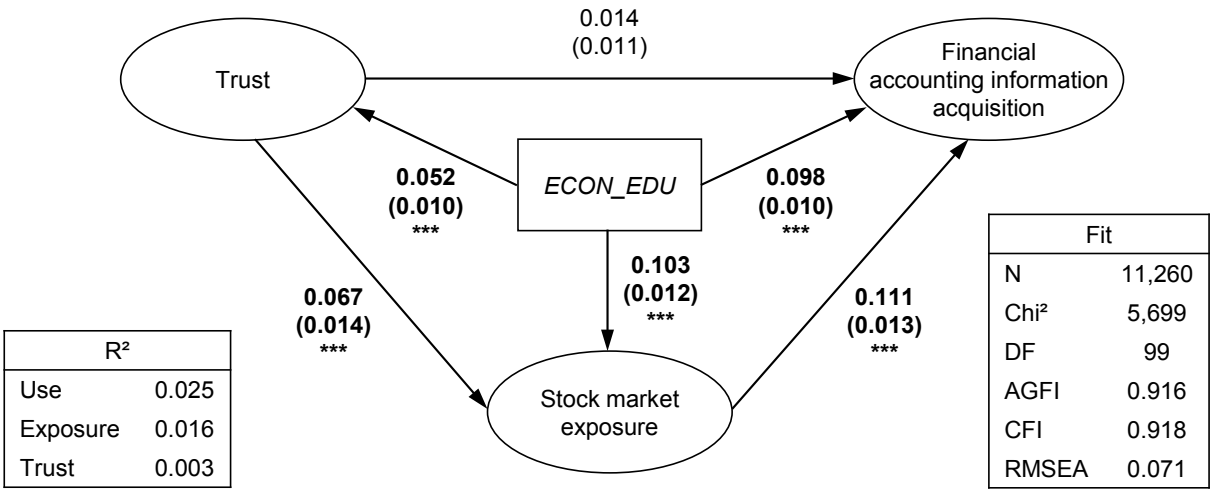
TRUST is a principal component representing the trust in stakeholders.

Figure 5: Proposed structural equation model



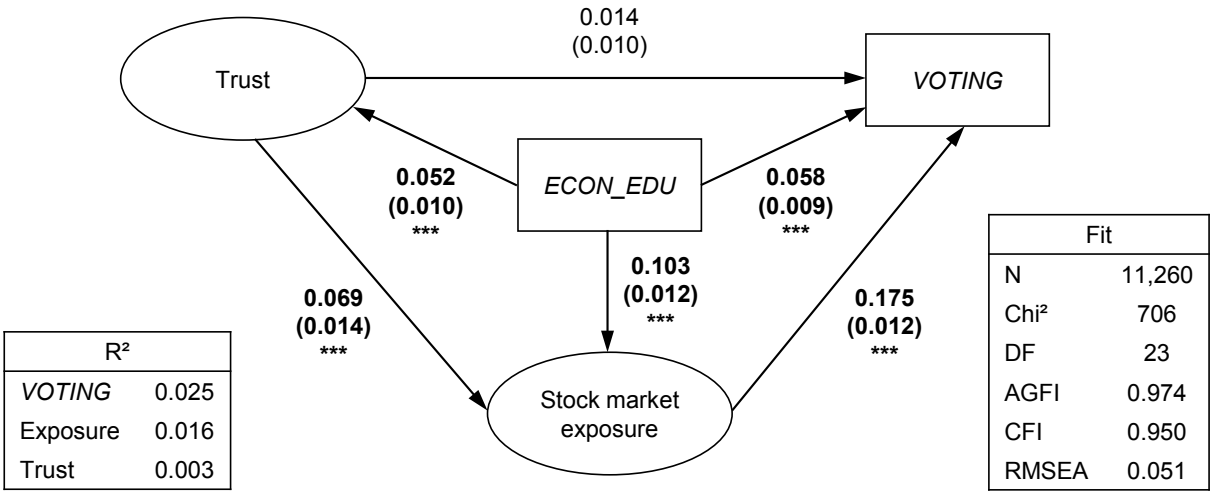
ECON_EDU is the level of general education conditional on having vocational training or academic education in economics or business.

Figure 6: Standardized structural equation modeling solution for financial accounting information acquisition



The maximum-likelihood parameter estimation is used for structural equation modeling. Trust is measured inversely by the four questionnaire items for agency risk perception. Financial accounting information acquisition is measured by the eight questionnaire items for the intensity of use of financial statements components. *ECON_EDU* is the level of general education conditional on having vocational training or academic education in economics or business. Stock market exposure is measured by the share of wealth (excluding own residence) that is invested in stocks except mutual funds *(%STOCKS),* the number of firms of which stocks are held *(#FIRMS),* and the investment strategy by time horizon *(HORIZON).* DF are the degrees of freedom. AGFI is the Adjusted Goodness of Fit Index. CFI is the Comparative Fit Index. RMSEA is the Root Mean Square Error of Approximation. Standard errors for parameter estimates are provided in braces. */**/*** marks significance at the 10/5/1% level.

Figure 7: Standardized structural equation modeling solution for voting behavior



The maximum-likelihood parameter estimation is used for structural equation modeling. Trust is measured inversely by the four questionnaire items for agency risk perception. *VOTING* represents the extent of previous or intended exercise of shareholder voting rights. *ECON_EDU* is the level of general education conditional on having vocational training or academic education in economics or business. Stock market exposure is measured by the share of wealth (excluding own residence) that is invested in stocks except mutual funds *(%STOCKS),* the number of firms of which stocks are held *(#FIRMS),* and the investment strategy by time horizon *(HORIZON).* DF are the degrees of freedom. AGFI is the Adjusted Goodness of Fit Index. CFI is the Comparative Fit Index. RMSEA is the Root Mean Square Error of Approximation. Standard errors for parameter estimates are provided in braces. */**/*** marks significance at the 10/5/1% level.

Table 1: Sample development

Questionnaires sent to individual shareholders of *Deutsche Post* (natural persons with residence in Germany)	465,321
Questionnaires returned (Dec 14, 2007—Jan 22, 2008)	44,321
Questionnaires with missing answers on demographic items	–7,924
Questionnaires with erroneous answers on any relevant item	–521
Shareholders who have delegated their investment decisions	–2,165
Shareholders aged less than 18 years	–30
Current or former employees of *Deutsche Post*	–4,005
Questionnaires with missing answers on agency risk or monitoring	–18,416
Final sample for main analysis	11,260

Table 2: Response pattern for agency risk perception

Question: How high do you rate the probability of betrayal by the following parties, negatively affecting your wealth position?

Scale: 1 (very low), 2 (low), 3 (moderate), 4 (high), 5 (very high)

Stakeholder	N	Mean	S.D.	Min	P25	Median	P75	Max
Management	11,260	3.520	1.091	1	3	4	4	5
Majority shareholder	11,260	3.509	1.014	1	3	4	4	5
Financial intermediaries	11,260	3.301	1.098	1	3	3	4	5
Other large investors	11,260	3.213	0.982	1	3	3	4	5

Table 3: Variable distribution for trust and demographic characteristics

Variable	N	Mean	S.D.	Min	P25	Median	P75	Max
TRUST	11,260	0.000	1.000	–2.088	–0.763	–0.009	0.631	3.053
MALE	11,260	0.899						
AGE	11,260	54.033	13.591	18	43	55	65	93
ECON	11,260	0.376						
EDU	11,260	0.761	0.296	0.000	0.400	1.000	1.000	1.000
ECON_EDU	11,260	0.311	0.429	0.000	0.000	0.000	0.800	1.000
HOUSING	11,260	0.771	0.267	0.167	0.667	0.833	1.000	1.000
PRODUCTIVITY	11,260	62,618	11,749	38,639	54,763	60,596	68,139	106,159
UNEMPLOYMENT	11,260	0.082	0.037	0.022	0.052	0.073	0.104	0.220
FOREIGNERS	11,260	0.100	0.055	0.007	0.057	0.092	0.136	0.235
TURNOUT	11,260	0.784	0.028	0.684	0.769	0.785	0.804	0.843
CONSERVATIVE	11,260	0.481	0.101	0.224	0.397	0.490	0.543	0.745
PARISHIONERS	11,260	0.610	0.180	0.059	0.533	0.647	0.732	0.919
CATHOLICS	11,260	0.487	0.236	0.050	0.280	0.501	0.703	0.956
EAST_GERMANY	11,260	0.124						

TRUST is a principal component representing the trust in stakeholders. *MALE* is a dummy for being male. *AGE* is the age. *ECON* is a dummy for having vocational training or academic education in economics or business. *EDU* is the level of general education. ECON_*EDU* is *ECON* * *EDU*. *HOUSING* is the level of the housing situation. *PRODUCTIVITY* is gross domestic product in Euro divided by persons in employment of the district of residence for 2007. *UNEMPLOYMENT* is the average unemployment rate of the district of residence for 2007. *FOREIGNERS* is the share of inhabitants of the district of residence without German citizenship end of 2007. *TURNOUT* is the voters turnout in the district of residence for the federal elections of 2005. *CONSERVATIVE* is the share of the votes for the five major German political parties that was collected by the Christian Democrats (CDU/CSU) or the Liberals (FDP) in the district of residence in the federal elections of 2005. *PARISHIONERS* is the share of inhabitants of the district of residence who are members of the Roman Catholic Church or the Evangelical Church in Germany based on the 2011 census. *CATHOLICS* is the number of members of the Roman Catholic Church divided by all members of the Roman Catholic Church and the Evangelical Church in Germany in the district of residence based on the 2011 census. *EAST_GERMANY* is a dummy for residence in the former German Democratic Republic including the whole of Berlin.

Table 4: Pearson (below) and Spearman (above) correlations for trust and demographic characteristics

	Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1)	*TRUST*	X	**0.029**	–0.014	**0.053**	**0.018**	**0.052**	**–0.020**	**0.027**	**0.019**	**0.034**	–0.013	**–0.025**	**–0.045**	**–0.017**	**0.022**
(2)	*MALE*	**0.028**	X	**0.081**	–0.010	**0.048**	–0.004	**0.048**	–0.013	**–0.033**	–0.014	**0.023**	**0.028**	**0.047**	0.013	**–0.030**
(3)	*LN_AGE*	**–0.021**	**0.076**	X	**–0.086**	**–0.109**	**–0.100**	**0.333**	**0.033**	**–0.041**	**0.034**	**0.077**	**0.023**	**0.041**	**0.016**	**–0.092**
(4)	*ECON*	**0.047**	–0.010	**–0.096**	X	**0.162**	**0.973**	**–0.034**	**0.072**	–0.001	**0.074**	**0.020**	–0.007	**–0.052**	0.001	–0.015
(5)	*EDU*	0.012	**0.043**	**–0.119**	**0.174**	X	**0.281**	**–0.066**	**0.051**	**0.073**	**0.091**	**–0.018**	**–0.079**	**–0.159**	**–0.029**	**0.094**
(6)	*ECON_EDU*	**0.043**	–0.002	**–0.117**	**0.934**	**0.347**	X	**–0.041**	**0.075**	0.012	**0.081**	0.015	**–0.018**	**–0.073**	–0.001	0.001
(7)	*HOUSING*	**–0.020**	**0.049**	**0.422**	**–0.034**	**–0.079**	**–0.050**	X	**–0.122**	**–0.145**	**–0.227**	**0.123**	**0.142**	**0.245**	0.001	**–0.119**
(8)	*LN_PRODUCTIVITY*	**0.037**	**–0.018**	**0.023**	**0.076**	**0.055**	**0.080**	**–0.092**	X	**–0.202**	**0.675**	**0.116**	**0.123**	**–0.162**	**0.239**	**–0.427**
(9)	*UNEMPLOYMENT*	**0.019**	**–0.035**	**–0.058**	–0.007	**0.084**	**0.018**	**–0.158**	**–0.294**	X	**0.078**	**–0.558**	**–0.833**	**–0.604**	**–0.460**	**0.548**
(10)	*FOREIGNERS*	**0.037**	**–0.019**	0.011	**0.075**	**0.098**	**0.087**	**–0.194**	**0.687**	–0.007	X	**–0.142**	**–0.123**	**–0.368**	**0.203**	**–0.262**
(11)	*TURNOUT*	–0.005	**0.021**	**0.075**	**0.027**	–0.012	**0.018**	**0.111**	**0.193**	**–0.584**	**–0.116**	X	**0.368**	**0.349**	**0.081**	**–0.395**
(12)	*CONSERVATIVE*	**–0.028**	**0.028**	**0.025**	–0.010	**–0.088**	**–0.030**	**0.146**	**0.148**	**–0.797**	**–0.107**	**0.334**	X	**0.635**	**0.621**	**–0.479**
(13)	*PARISHIONERS*	**–0.039**	**0.047**	**0.072**	**–0.033**	**–0.156**	**–0.066**	**0.220**	**0.052**	**–0.724**	**–0.177**	**0.420**	**0.669**	X	**0.530**	**–0.567**
(14)	*CATHOLICS*	–0.015	0.012	**0.019**	0.002	**–0.029**	–0.001	**0.018**	**0.256**	**–0.454**	**0.230**	**0.092**	**0.621**	**0.546**	X	**–0.406**
(15)	*EAST_GERMANY*	**0.019**	**–0.030**	**–0.090**	–0.015	**0.094**	0.011	**–0.140**	**–0.445**	**0.696**	**–0.249**	**–0.417**	**–0.498**	**–0.785**	**–0.412**	X

N = 11,260. *TRUST* is a principal component representing the trust in stakeholders. *MALE* is a dummy for being male. *LN_AGE* is the natural logarithm of age. *ECON* is a dummy for having vocational training or academic education in economics or business. *EDU* is the level of general education. ECON_*EDU* is *ECON* * *EDU*. *HOUSING* is the level of the housing situation. *LN_PRODUCTIVITY* is the natural logarithm of gross domestic product in Euro divided by persons in employment of the district of residence for 2007. *UNEMPLOYMENT* is the average unemployment rate of the district of residence for 2007. *FOREIGNERS* is the share of inhabitants of the district of residence without German citizenship end of 2007. *TURNOUT* is the voters turnout in the district of residence for the federal elections of 2005. *CONSERVATIVE* is the share of the votes for the five major German political parties that was collected by the Christian Democrats (CDU/CSU) or the Liberals (FDP) in the district of residence in the federal elections of 2005. *PARISHIONERS* is the share of inhabitants of the district of residence who are members of the Roman Catholic Church or the Evangelical Church in Germany based on the 2011 census. *CATHOLICS* is the number of members of the Roman Catholic Church divided by all members of the Roman Catholic Church and the Evangelical Church in Germany in the district of residence based on the 2011 census. *EAST_GERMANY* is a dummy for residence in the former German Democratic Republic including the whole of Berlin. Bold values indicate significance at the 10% level or lower.

Table 5: Regression analysis of trust

Variable	*TRUST* (OLS)		*TRUST* (OLS)		*TRUST* (OLS)		*TRUST* ≥ median (logit)	
Intercept	—		—		—		–0.219 (6.142)	
MALE	**0.094 (0.031)**	***	**0.103 (0.031)**	***	**0.099 (0.032)**	***	**0.202 (0.066)**	***
ECON	**0.132 (0.061)**	**	**0.131 (0.061)**	**	**0.132 (0.062)**	**	**0.282 (0.128)**	**
EDU	0.015 (0.038)		–0.009 (0.038)		–0.09 (0.039)		0.028 (0.081)	
ECON_EDU	–0.051 (0.072)		–0.057 (0.072)		–0.057 (0.073)		–0.071 (0.151)	
HOUSING	–0.030 (0.039)		0.024 (0.040)		0.024 (0.042)		–0.093 (0.086)	
LN_PRODUCTIVITY	—		**0.225 (0.086)**	***	—		—	
UNEMPLOYMENT	—		–0.310 (0.597)		—		—	
FOREIGNERS	—		0.287 (0.307)		—		—	
TURNOUT	—		0.145 (0.449)		—		—	
CONSERVATIVE	—		–0.188 (0.197)		—		—	
PARISHIONERS	—		–0.008 (0.149)		—		—	
CATHOLICS	—		–0.023 (0.066)		—		—	
EAST_GERMANY	—		**0.123 (0.072)**	*	—		—	
Fixed effects	Age class		Age class		Age class District		Age class District	
R^2 (adjusted)	0.005		0.007		0.018		—	
R^2 (Nagelkerke)	—		—		—		0.061	
Response levels	—		—		—		2	
N	11,260		11,260		11,260		11,260	

TRUST is a principal component representing the trust in stakeholders. *MALE* is a dummy for being male. *ECON* is a dummy for having vocational training or academic education in economics or business. *EDU* is the level of general education. ECON*_EDU* is *ECON* * *EDU*. *HOUSING* is the level of the housing situation. *LN_PRODUCTIVITY* is the natural logarithm of gross domestic product in Euro divided by persons in employment of the district of residence for 2007. *UNEMPLOYMENT* is the average unemployment rate of the district of residence for 2007. *FOREIGNERS* is the share of inhabitants of the district of residence without

German citizenship end of 2007. *TURNOUT* is the voters turnout in the district of residence for the federal elections of 2005. *CONSERVATIVE* is the share of the votes for the five major German political parties that was collected by the Christian Democrats (CDU/CSU) or the Liberals (FDP) in the district of residence in the federal elections of 2005. *PARISHIONERS* is the share of inhabitants of the district of residence who are members of the Roman Catholic Church or the Evangelical Church in Germany based on the 2011 census. *CATHOLICS* is the number of members of the Roman Catholic Church divided by all members of the Roman Catholic Church and the Evangelical Church in Germany in the district of residence based on the 2011 census. *EAST_GERMANY* is a dummy for residence in the former German Democratic Republic including the whole of Berlin. Standard errors for parameter estimates are provided in braces. */**/*** marks significance at the 10/5/1% level.

Table 6: Response pattern for relevance of information sources

Question: How do you assess the relevance of the following information sources for making your investment decisions?

Scale: 1 (very low), 2 (low), 3 (moderate), 4 (high), 5 (very high)

Information source	N	Mean	S.D.	Min	P25	Median	P75	Max
Media	11,260	3.976	0.849	1	4	4	5	5
Annual report	11,260	3.191	1.117	1	2	3	4	5
Banks and brokers	11,260	2.922	1.146	1	2	3	4	5
Interim report	11,260	2.904	1.139	1	2	3	4	5
Investor relations	11,260	2.774	1.073	1	2	3	4	5
Company website	11,260	2.650	1.125	1	2	3	3	5
Social circle	11,260	2.046	1.027	1	1	2	3	5

Table 7: Subsample analysis of relevance of information sources by trust

Information source	*TRUST* < median (a)	*TRUST* ≥ median (b)	(b) – (a)	
Media	3.947	**4.006**	0.059 (0.016)	***
Annual report	3.160	**3.223**	0.063 (0.021)	***
Banks and brokers	2.879	**2.965**	0.086 (0.022)	***
Interim report	2.869	**2.940**	0.071 (0.022)	***
Investor relations	2.757	**2.792**	0.036 (0.020)	*
Company website	2.634	2.667	0.033 (0.021)	
Social circle	**2.065**	2.026	–0.039 (0.019)	**
N	5,633	5,627		

N = 11,260. *TRUST* is a principal component representing the trust in stakeholders. Bold values indicate a significantly greater value compared to the other subsample. Standard errors for parameter estimates are provided in braces. */**/*** marks significance at the 10/5/1% level.

Table 8: Response pattern for intensity of use of the annual report

Question: How intensively do you use the individual components of the annual report?

Scale: 1 (very low intensity), 2 (low intensity), 3 (moderate intensity), 4 (high intensity), 5 (very high intensity)

Component	N	Mean	S.D.	Min	P25	Median	P75	Max
Income statement	11,260	3.452	1.121	1	3	4	4	5
Balance sheet	11,260	3.364	1.103	1	3	4	4	5
Management discussion and analysis	11,260	3.189	1.081	1	3	3	4	5
Letter to the shareholders	11,260	3.049	1.039	1	2	3	4	5
Statement of changes in equity	11,260	3.018	1.154	1	2	3	4	5
Remuneration report	11,260	2.959	1.139	1	2	3	4	5
Cash flow statement	11,260	2.807	1.154	1	2	3	4	5
Report by the supervisory board	11,260	2.752	1.034	1	2	3	3	5
Segment reporting	11,260	2.720	1.098	1	2	3	3	5
Corporate governance report	11,260	2.473	1.037	1	2	3	3	5
Auditor's opinion	11,260	2.408	1.169	1	1	2	3	5
Notes	11,260	2.360	1.041	1	2	2	3	5

Bold components indicate financial statements components.

Table 9: Subsample analysis of intensity of use of the annual report by trust

Component	*TRUST* < median (a)	*TRUST* ≥ median (b)	(b) – (a)	
Income statement	3.409	**3.496**	0.087 (0.021)	***
Balance sheet	3.331	**3.398**	0.067 (0.021)	***
Management discussion and analysis	3.107	**3.271**	0.164 (0.020)	***
Letter to the shareholders	3.001	**3.098**	0.096 (0.020)	***
Statement of changes in equity	3.027	3.001	–0.018 (0.022)	
Remuneration report	**3.013**	2.904	–0.109 (0.021)	***
Cash flow statement	2.781	**2.834**	0.053 (0.022)	**
Report by the supervisory board	2.718	**2.786**	0.068 (0.020)	***
Segment reporting	2.664	**2.776**	0.113 (0.021)	***
Corporate governance report	2.449	**2.498**	0.049 (0.020)	**
Auditor's opinion	2.423	2.394	–0.030 (0.022)	
Notes	2.320	**2.401**	0.081 (0.020)	***
N	5,633	5,627		

N = 11,260. *TRUST* is a principal component representing the trust in stakeholders. Bold components indicate financial statements components. Bold values indicate a significantly greater value compared to the other subsample. Standard errors for parameter estimates are provided in braces. */**/*** marks significance at the 10/5/1% level.

Table 10: Variable distribution for monitoring proxies and investor characteristics

Variable	N	Mean	S.D.	Min	P25	Median	P75	Max
FINACC	11,260	0.000	1.000	–2.186	–0.647	0.106	0.696	2.354
VOTING	11,260	0.607	0.357	0.000	0.250	0.750	0.750	1.000
TRUST	11,260	0.000	1.000	–2.088	–0.763	–0.009	0.631	3.053
ECON_EDU	11,260	0.311	0.429	0.000	0.000	0.000	0.800	1.000
%STOCKS	11,260	0.298	0.222	0.010	0.100	0.250	0.400	1.000
#FIRMS	11,260	11.229	13.058	1	5	8	14	500
HORIZON	11,260	0.865	0.259	0.000	1.000	1.000	1.000	1.000
YEARS	11,260	17.562	10.761	0	10	15	23	75
MALE	11,260	0.899						
AGE	11,260	54.033	13.591	18	43	55	65	93
HOUSING	11,260	0.771	0.267	0.167	0.667	0.833	1.000	1.000

FINACC is a principal component representing the intensity of financial accounting information acquisition. *VOTING* represents the past or intended exercise of shareholder voting rights. *TRUST* is a principal component representing the trust in stakeholders. *ECON_EDU* is the level of general education conditional on having vocational training or academic education in economics or business. *%STOCKS* is the share of wealth (excluding own residence) that is invested in stocks except mutual funds. *#FIRMS* is the number of firms of which stocks are held. *HORIZON* is the investment strategy by time horizon. *YEARS* is the number of years having been invested in stocks except mutual funds. *MALE* is a dummy for being male. *AGE* is the age. *HOUSING* is the level of the housing situation.

Table 11: Pearson (below) and Spearman (above) correlations for monitoring proxies and investor characteristics

	Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1)	*FINACC*	X	**0.195**	**0.046**	**0.113**	**0.063**	**0.097**	**–0.036**	**0.099**	**0.042**	**0.150**	**0.055**
(2)	*VOTING*	**0.214**	X	**0.043**	**0.090**	**0.144**	**0.204**	**–0.029**	**0.249**	**0.058**	**0.126**	0.008
(3)	*TRUST*	**0.043**	**0.042**	X	**0.052**	**0.063**	**0.062**	**0.033**	**0.039**	**0.029**	–0.014	**–0.020**
(4)	*ECON_EDU*	**0.101**	**0.077**	**0.043**	X	**0.058**	**0.115**	**0.024**	**0.112**	–0.004	**–0.100**	**–0.041**
(5)	*%STOCKS*	**0.057**	**0.105**	**0.055**	**0.055**	X	**0.574**	0.004	**0.279**	**0.054**	**0.021**	**–0.027**
(6)	*#FIRMS*	**0.082**	**0.125**	**0.030**	**0.077**	**0.399**	X	**–0.018**	**0.381**	**0.100**	**0.120**	**0.088**
(7)	*HORIZON*	**–0.022**	–0.009	**0.030**	**0.026**	0.008	–0.009	X	**–0.040**	–0.012	**–0.166**	**–0.035**
(8)	*LN_YEARS*	**0.099**	**0.225**	**0.041**	**0.104**	**0.246**	**0.262**	**–0.024**	**X**	**0.097**	**0.430**	**0.220**
(9)	*MALE*	**0.048**	**0.059**	**0.028**	–0.002	**0.045**	**0.067**	–0.014	**0.094**	X	**0.081**	**0.048**
(10)	*LN_AGE*	**0.143**	**0.109**	**–0.021**	**–0.117**	0.002	**0.095**	**–0.129**	**0.442**	**0.076**	X	**0.333**
(11)	*HOUSING*	**0.062**	**0.029**	**–0.020**	**–0.050**	**–0.031**	**0.059**	**–0.038**	**0.250**	**0.049**	**0.422**	X

N = 11,260. *FINACC* is a principal component representing the intensity of financial accounting information acquisition. *VOTING* represents the past or intended exercise of shareholder voting rights. *TRUST* is a principal component representing the trust in stakeholders. *ECON_EDU* is the level of general education conditional on having vocational training or academic education in economics or business. *%STOCKS* is the share of wealth (excluding own residence) that is invested in stocks except mutual funds. *#FIRMS* is the number of firms of which stocks are held. *HORIZON* is the investment strategy by time horizon. *LN_YEARS* is the natural logarithm of one plus the number of years having been invested in stocks except mutual funds. *MALE* is a dummy for being male. *LN_AGE* is the natural logarithm of age. *HOUSING* is the level of the housing situation. Bold values indicate significance at the 10% level or lower.

Table 12: Regression analysis of monitoring proxies

Variable	*FINACC* (OLS)		*FINACC* (OLS)		*VOTING* (logit)		*VOTING* (logit)	
Intercept	**–0.072 (0.035)**	**	—		Not reported		Not reported	
TRUST	**0.040 (0.009)**	***	**0.039 (0.009)**	***	**0.057 (0.017)**	***	**0.042 (0.018)**	**
ECON_EDU	**0.218 (0.022)**	***	**0.259 (0.022)**	***	**0.325 (0.041)**	***	**0.280 (0.042)**	***
%STOCKS	**0.112 (0.046)**	**	**0.126 (0.046)**	***	**0.557 (0.088)**	***	**0.299 (0.089)**	***
#FIRMS	**0.005 (0.001)**	***	**0.004 (0.001)**	***	**0.024 (0.002)**	***	**0.016 (0.002)**	***
HORIZON	**–0.096 (0.036)**	***	–0.007 (0.036)		**–0.130 (0.067)**	*	–0.033 (0.068)	
LN_YEARS	—		–0.004 (0.019)		—		**0.644 (0.037)**	***
MALE	—		**0.099 (0.031)**	***	—		**0.188 (0.058)**	***
HOUSING	—		0.055 (0.038)		—		**–0.269 (0.072)**	***
Fixed effects	—		Age class		—		Age class	
R^2 (adjusted)	0.018		0.044		—		—	
R^2 (Nagelkerke)	—		—		0.041		0.089	
Response levels	—		—		5		5	
N	11,260		11,260		11,260		11,260	

FINACC is a principal component representing the intensity of financial accounting information acquisition. *VOTING* represents the past or intended exercise of shareholder voting rights. *TRUST* is a principal component representing the trust in stakeholders. ECON_*EDU* is the level of general education conditional on having vocational training or academic education in economics or business. *%STOCKS* is the share of wealth (excluding own residence) that is invested in stocks except mutual funds. *#FIRMS* is the number of firms of which stocks are held. *HORIZON* is the investment strategy by time horizon. *LN_YEARS* is the natural logarithm of one plus the number of years having been invested in stocks except mutual funds. *MALE* is a dummy for being male. *HOUSING* is the level of the housing situation. Standard errors for parameter estimates are provided in braces. Estimates for logit regressions are the natural logarithms of the odds ratios. */**/*** marks significance at the 10/5/1% level.

Table 13: Summary of structural equation modeling solutions for final and relaxed sample

Monitoring type	Financial accounting information acquisition		*VOTING*	
Sample	Final sample	Relaxed sample	Final sample	Relaxed sample
N	11,260	18,987	11,260	25,857
Chi^2	5,699	9,743	706	1,429
DF	99	99	23	23
AGFI	0.916	0.915	0.974	0.977
CFI	0.918	0.919	0.950	0.957
RMSEA	0.071	0.072	0.051	0.049
R^2 for monitoring type	0.025	0.027	0.037	0.036
Direct significant link from trust to monitoring?	No	(+)**	No	(+)**

The maximum-likelihood parameter estimation is used for structural equation modeling. Financial accounting information acquisition is measured by the eight questionnaire items for the intensity of use of financial statements components. *VOTING* represents the past or intended exercise of shareholder voting rights. DF are the degrees of freedom. AGFI is the Adjusted Goodness of Fit Index. CFI is the Comparative Fit Index. RMSEA is the Root Mean Square Error of Approximation. Trust is measured inversely by the four questionnaire items for agency risk perception. */**/*** marks significance at the 10/5/1% level.

Table 14: Comparison of trust, monitoring, and controls by affiliation with *Deutsche Post*

Variable	Final sample (no affiliation with *Deutsche Post*) (a)	*Deutsche Post* affiliates with one investment (b)	(b) – (a)	
TRUST	0.000	–0.022	–0.022 (0.075)	
FINACC	–0.001	0.083	0.084 (0.075)	
VOTING	**0.607**	0.443	–0.164 (0.027)	***
ECON_EDU	**0.311**	0.198	–0.113 (0.032)	***
%STOCKS	**0.298**	0.099	–0.199 (0.017)	***
#FIRMS	**11.229**	1.000	–10.229 (0.973)	***
HORIZON	**0.865**	0.786	–0.079 (0.020)	***
YEARS	**17.562**	9.339	–8.224 (0.805)	***
MALE	**0.899**	0.633	–0.266 (0.023)	***
AGE	**54.033**	48.539	–5.494 (1.018)	***
HOUSING	**0.771**	0.718	–0.054 (0.020)	**
N	11,260	180		

N = 11,440. *TRUST* is a principal component representing the trust in stakeholders. *FINACC* is a principal component representing the intensity of financial accounting information acquisition. *VOTING* represents the past or intended exercise of shareholder voting rights. ECON_*EDU* is the level of general education conditional on having vocational training or academic education in economics or business. *%STOCKS* is the share of wealth (excluding own residence) that is invested in stocks except mutual funds. *#FIRMS* is the number of firms of which stocks are held. *HORIZON* is the investment strategy by time horizon. *YEARS* is the number of years having been invested in stocks except mutual funds. *MALE* is a dummy for being male. *AGE* is the age. *HOUSING* is the level of the housing situation. Bold values indicate a significantly greater value compared to the other subsample. Standard errors for parameter estimates are provided in braces. */**/*** marks significance at the 10/5/1% level.

Table 15: Regression analysis of trust and monitoring for *Deutsche Post* affiliates with one investment

Variable	*TRUST* (OLS)	*FINACC* (OLS)	*VOTING* (logit)
Intercept	—	—	Not reported
TRUST	—	**0.131 (0.075)** *	0.039 (0.144)
ECON	–0.198 (0.415)	—	—
EDU	0.483 (0.421)	—	—
ECON_EDU	0.269 (0.643)	0.012 (0.216)	**1.092 (0.426)** **
%STOCKS	—	0.328 (0.592)	0.256 (1.133)
HORIZON	—	–0.145 (0.224)	–0.468 (0.449)
LN_YEARS	—	–0.086 (0.174)	–0.078 (0.337)
MALE	**–0.277 (0.162)** *	0.109 (0.158)	0.382 (0.305)
HOUSING	0.281 (0.262)	0.179 (0.257)	–0.342 (0.495)
Fixed effects	Age class	Age class	Age class
R^2 (adjusted)	0.011	0.058	—
R^2 (Nagelkerke)	—	—	0.115
Response levels	—	—	5
N	180	180	180

FINACC is a principal component representing the intensity of financial accounting information acquisition. *VOTING* represents the past or intended exercise of shareholder voting rights. *TRUST* is a principal component representing the trust in stakeholders. *ECON* is a dummy for having vocational training or academic education in economics or business. *EDU* is the level of general education. ECON_*EDU* is *ECON* * *EDU*. *%STOCKS* is the share of wealth (excluding own residence) that is invested in stocks except mutual funds. *HORIZON* is the investment strategy by time horizon. *LN_YEARS* is the natural logarithm of one plus the number of years having been invested in stocks except mutual funds. *MALE* is a dummy for being male. *HOUSING* is the level of the housing situation. Standard errors for parameter estimates are provided in braces. Estimates for logit regressions are the natural logarithms of the odds ratios. */**/*** marks significance at the 10/5/1% level.